



San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

FINAL DRAFT STAFF REPORT

ADDRESSING GREENHOUSE GAS EMISSIONS IMPACTS UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT



SEPTEMBER 17, 2009

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EXECUTIVE SUMMARY

Global Climate Change (GCC), which is now generally accepted by the scientific community to be occurring and caused by Greenhouse Gases (GHGs), is a widely discussed scientific, economic, and political issue in the United States. Briefly stated, GCC is the cumulative change in the average weather of the earth that may be measured by changes in temperature, precipitation, storms, and wind. GHGs are gases that trap heat in the atmosphere. The scientific and policy communities in the State of California have collectively concluded that a significant and growing scientific body of evidence supports the need for regulating GHG emissions. Worldwide, California is estimated to be the 15th largest emitter of carbon dioxide (CARB 2008), and this fact has added to the impetus behind California's leadership in this area.

California is exercising climate change leadership in two significant efforts: one, the passage and implementation of Assembly Bill 32 (AB32), the "California Global Warming Solutions Act of 2006", which was designed to significantly reduce existing and future GHG emissions in the State of California; and two, in the analysis of environmental impacts of new GHG emissions related to discretionary project approvals under the California Environmental Quality Act (CEQA). This latter effort has been particularly difficult to implement as no state or local agency has provided definitive guidance on how to address GHG emissions impacts under CEQA.

Recognizing the dearth of regulatory guidance, the San Joaquin Valley Air Pollution Control District's Governing Board adopted the Climate Change Action Plan (CCAP) in August 2008. The CCAP directed the District's Air Pollution Control Officer to develop guidance to assist District staff, valley businesses, land-use agencies, and other permitting agencies in addressing GHG emissions as part of the CEQA process. The CCAP also directs District staff to investigate and develop a greenhouse gas banking program, enhance the existing emissions inventory process to include greenhouse gas emissions reporting consistent with new state requirements, and administer voluntary greenhouse gas emission reduction agreements. These items would then be brought before the Governing

Board for their consideration. Regarding CEQA GHG guidance, the goals of the CCAP are to establish District processes for assessing the significance of project specific GHG impacts for projects permitted by the District; assist local land use agencies, developers, and the public by identifying and quantifying GHG emission reduction measures for development projects and by providing tools to streamline evaluation of project specific GHG effects; ensure that collateral emissions from GHG emission reduction projects do not adversely impact public health or environmental justice communities in the Valley; and assist Valley businesses in complying with state law related to GHG emission reduction.

CEQA requires lead agencies to establish specific procedures for administering its responsibilities under CEQA, including orderly evaluation of projects and preparation of environmental documents. Therefore, the District is developing guidance for its own internal use when serving as the lead agency, and is also proposing guidance to assist other agencies in establishing their own processes for determining significance of project related impacts on global climate change. Nothing in this guidance shall be construed as limiting a lead agency's authority to adopt a statement of overriding consideration for projects with significant GHG impact.

This staff report provides a summary of background information on Global Climate Change, the current regulatory environment surrounding GHG emissions, and the various concepts in addressing the potential impacts of Global Climate Change. It evaluates different approaches for estimating impacts, and summarizes potential mitigation measures. As presented in this Staff Report, District staff concludes that existing science is inadequate to support quantification of impacts that project specific GHG emissions have on global climatic change. This is readily understood when one considers that global climatic change is the result of the sum total of GHG emissions, both man made and natural that occurred in the past; that is occurring now; and will occur in the future. The effects of project specific GHG emissions are cumulative, and without mitigation, their incremental contribution to global climatic change could be considered significant. District staff concludes that this cumulative impact is best addressed by requiring all projects subject to CEQA to reduce their GHG emissions through project design elements.

District staff has proposed an approach intended to streamline the process of determining if project specific GHG emissions would have a significant effect. The proposed approach relies on the use of performance based standards and their associated pre-quantified GHG emission reduction effectiveness (Best Performance Standards). Establishing Best Performance Standards (BPS) would help project proponents, lead agencies, and the public by proactively identifying effective, feasible mitigation measures. Emission reductions achieved through implementation of BPS would be pre-quantified thus, negating the need for project specific quantification of GHG emissions.

As defined, BPS is the most effective, achieved-in-practice, means of reducing or limiting GHG emissions from a GHG emissions source. For traditional stationary source projects, BPS includes equipment type, equipment design, and operational

and maintenance practices for the identified service, operation, or emissions unit class and category. For development projects, BPS includes project design elements, land use decisions, and technologies that reduce GHG emissions.

BPS would be established through a process approved by the District's Governing Board. The proposed process would provide ample opportunity for stakeholders and other interested parties to participate and provide valuable input into the establishment of baseline GHG emissions and BPS.

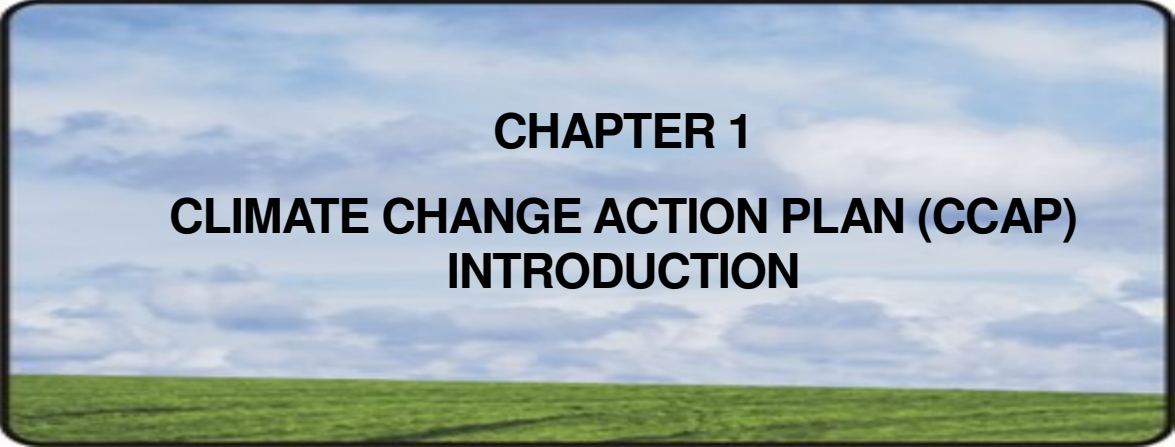
Once BPS has been established, projects implementing Best Performance Standards would be determined to have a less than significant individual and cumulative impact on global climate change and would not require project specific quantification of GHG emissions. Projects exempt from the requirements of CEQA, and projects complying with an approved GHG emission reduction plan or mitigation program would also be determined to have a less than significant individual and cumulative impact. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources and have a certified Final CEQA document.

Projects not implementing BPS would require quantification of project specific GHG emissions. To be determined to have a less than significant individual and cumulative impact on global climate changes, such projects must be determined to have reduced or mitigated GHG emissions by 29%, consistent with GHG emission reduction targets established in ARB's AB 32 Scoping Plan¹. Furthermore, quantification of GHG emissions would be required for all projects for which the lead agency has determined that an Environmental Impact Report is required, whether or not the project incorporates Best Performance Standards.

In evaluating GHG emissions from a specific project the District recommends that a lead agency characterize both direct and indirect GHG emissions. Direct GHG emissions would include emissions resulting from a specific operation or process, e.g. fuel combustion emissions from a boiler. Indirect GHG emissions would include emissions resulting from project related energy consumption, e.g. electricity consumed by the production and electricity required to produce and transport water used by the project. For projects resulting in increased vehicle miles traveled (VMT), indirect GHG emissions associated with transportation related activities would also be included in the GHG emissions quantification.

The proposed methodology the District will use when establishing BPS and assessing GHG significance requires approval by the District Governing Board. However, approval of this methodology would not constitute adoption of a rule or regulation. Other agencies may choose to use this proposed process as guidance when establishing their own procedures for assessing the significance of project specific impacts on global climate change.

¹ *Climate Change Proposed Scoping Plan*; P. 12 and 21. California Air Resources Board, October 2008



CHAPTER 1

CLIMATE CHANGE ACTION PLAN (CCAP) INTRODUCTION

1.1 General Climate Change Issues and Background

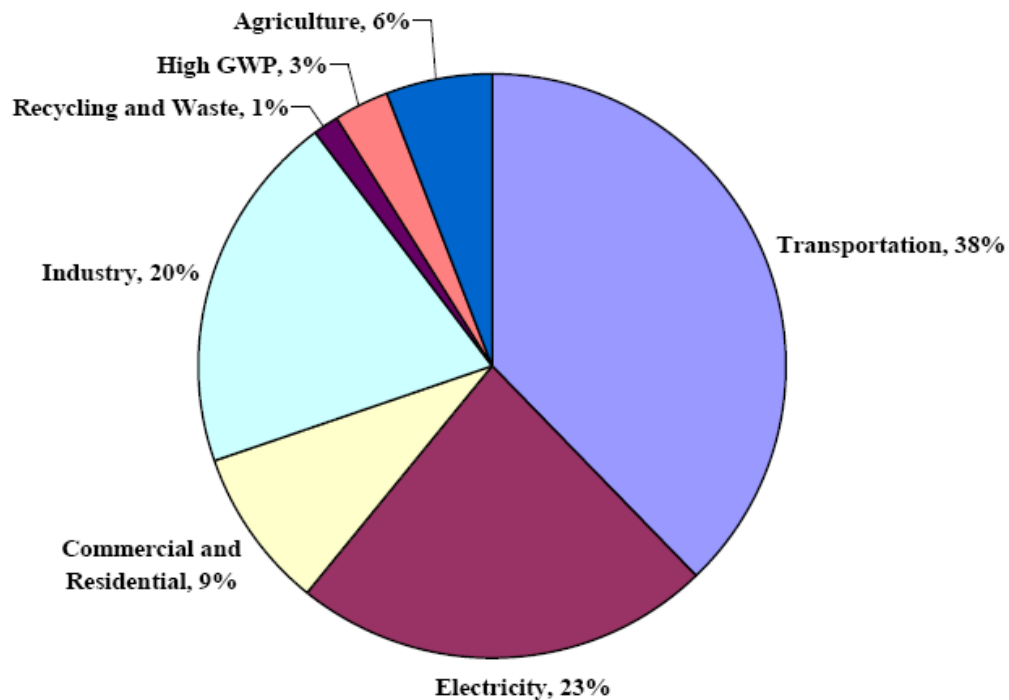
The scientific and political communities in the State of California have collectively concluded that a significant and growing scientific body of evidence supports the need for regulating GHG emissions. Compilations of data and analyses, such as the 2007 report from the Intergovernmental Panel on Climate Change (IPCC), have provided a generally accepted scientific basis for implementing climate change policy.

In the last few years information and data have been compiled that demonstrate increases in average global air and ocean temperatures are occurring (AEP 2007). According to the IPCC Report, global temperatures are expected to rise approximately 0.2 degree Celsius per decade for the next couple of decades under a variety of scenarios (IPCC 2007). Further, global temperatures are expected to continue to increase for centuries as a result of human activities due to the time scales associated with climate processes and feedbacks, even if GHG concentrations are stabilized. As a result, based on the current understanding of climate-carbon feedback, model studies show that substantial GHG emission reductions are necessary to avoid substantial increases in global air and ocean temperatures.



As a result of human activities, such as electricity production, vehicle use, etc., GHGs have been accumulating in the earth's atmosphere at a faster rate than has occurred historically, i.e., prior to the Industrial Age starting approximately 150 years ago (AEP 2007). Figure 1 shows that the largest source of GHG in California is transportation, contributing 38 percent of the State's total GHG emissions for the 2002-2004 average emissions, expressed in million metric tons Carbon Dioxide Equivalent (MMT CO_2E), up from 35% in 1990. Electricity generation and importation is the second largest source, contributing over 25 percent of the State's GHG emissions (ARB 2008). Additional information is available from the Air Resources Board (www.arb.ca.gov).

Figure 1: California's Greenhouse Gas Emissions by Sector (Gross Emissions: 469 MMT CO_2E)



Source: ARB, 2008

Some greenhouse gases such as water vapor occur naturally and are emitted to the atmosphere through natural processes as well as through human activities. The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide. GHGs can include:

Water Vapor: Although not considered a pollutant, water vapor is the most important, abundant, and variable GHG. In the atmosphere, it maintains a climate necessary for life. The main source of water vapor is evaporation from the ocean (approximately 85 percent). Other sources include sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves.

Ozone: Unlike other GHG, ozone is relatively short- lived and, therefore, is not global in nature. It is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global climate change (AEP 2007).

Aerosols: Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light. Cloud formation can also be affected by aerosols. Sulfate aerosols are emitted when fuel-containing sulfur is burned. Black carbon (or soot) is emitted during bio mass burning or incomplete combustion of fossil fuels. Particulate matter regulation has been lowering aerosol concentrations in the United States; however, global concentrations are likely increasing.

Chlorofluorocarbons: Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in CH₄ or ethane with chlorine and/or fluorine atoms. CFCs are nonflammable, nontoxic, insoluble, and chemically uncreative in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as cleaning solvents, refrigerants, and aerosol propellants. They destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol in 1987 (AEP 2007).

Carbon dioxide: Carbon dioxide (CO₂) is an odorless, colorless gas, which has both natural and anthropogenic sources. Natural sources include the following: respiration of bacteria, plants, animals, and fungus, evaporation from oceans, volcanic outgassing, and decomposition of dead organic matter. Anthropogenic sources of carbon dioxide are from burning coal, oil, natural gas, and wood. Concentrations of CO₂ were 379 parts per million (ppm) in 2005, which is an increase of 1.4 ppm per year since 1960 (AEP 2007).

Methane: Methane (CH₄) is a flammable gas and is the main component of natural gas. When one molecule of CH₄ is burned in the presence of oxygen, one molecule of carbon dioxide and two molecules of water are released. There are no direct ill health effects from CH₄. A natural source of CH₄ is from the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain CH₄, which is extracted for fuel. Other sources are from cattle, fermentation of manure, and landfills.

Nitrous oxide: Nitrous oxide (N_2O), also known as laughing gas, is a colorless greenhouse gas. Higher concentrations of N_2O can cause euphoria, dizziness, and slight hallucinations. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (nitric acid production, nylon production, fossil fuel-fired power plants, and vehicle emissions) also contribute to its atmospheric load. It is used in racecars, rocket engines, and as an aerosol spray propellant.

Fluorinated Gases: Gases that are synthetic, powerful GHG that are emitted from a variety of industrial processes.

- Hydrofluorocarbons: Hydrofluorocarbons (HFCs) are synthetic man-made chemicals that are used as a substitute for CFCs for automobile air conditioners and refrigerants.
- Perfluorocarbons: Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere. High-energy ultraviolet rays, roughly 60 kilometers above the earth's surface are able to destroy the compounds. PFCs have long lifetimes, ranging between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane and hexafluoroethane. Concentrations of tetrafluoromethane in the atmosphere are over 70 parts per trillion (ppt) (AEP 2007). The two main sources of PFCs are primary aluminum production and semiconductor manufacture.
- Sulfur hexafluoride: Sulfur hexafluoride (SF_6) is an inorganic, colorless, odorless, nontoxic, nonflammable gas. Concentrations in the 1990s were roughly 4 ppt (AEP 2007). SF_6 is used for insulation in electric power transmission and distribution equipment, in semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.

Under Assembly Bill 32 (AB32) GHGs are defined as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

The global warming potential (GWP) of the various GHGs is assigned as a measure of their relative average global radiative forcing effect, the potential of a gas or aerosol to trap heat in the atmosphere. Individual GHG species have varying GWP and atmospheric lifetimes. The carbon dioxide equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a single metric. The reference gas for GWP is carbon dioxide with a GWP of one and GWP weighted emissions are measured in terms of CO_2 equivalents (CO_2E) (EPA 2008). For example, methane has a GWP of 21; methane has a 21 times greater global warming effect than carbon dioxide on a weight basis (EPA 2008). Several GWPs of other GHGs are shown in Table 1 below:

Table 1: Global Warming Potential of GHGs

Gas	Atmospheric Lifetime	GWP
Carbon dioxide (CO ₂)	50 – 200	1
Methane (CH ₄)	12 ± 3	21
Nitrous oxide (N ₂ O)	120	310
HFC-23 (Hydrofluorocarbons)	264	11,700
HFC-32	5.6	650
HFC-125	32.6	2,800
HFC-134a	14.6	1,300
HFC-143a	48.3	3,800
HFC-152a	1.5	140
HFC-227ea	36.5	2,900
HFC-236fa	209	6,300
HFC-4310mee	17.1	1,300
CF ₄ (Perfluorocarbons)	50,000	6,500
C ₂ F ₆	10,000	9,200
C ₄ F ₁₀	2,600	7,000
C ₆ F ₁₄	3,200	7,400
Sulfur hexafluoride (SF ₆)	3,200	23,900

Source: U.S. EPA (<http://www.epa.gov/>)

1.2 Legislation Relative to Addressing GHG Impacts



Executive Order S-3-05

In response to the increasing body of evidence that GHGs will continue to affect global climate, Governor Schwarzenegger issued executive order (EO S-3-05) in June 2005, which established several greenhouse gas emission reduction targets for California. GHG emissions are to be reduced to 2000 emission levels by 2010; to 1990 emission levels by 2020 (a 29% reduction from business as usual emissions levels projected for 2020) (CARB 2008)); and to 80% below 1990 levels by 2050.

Assembly Bill 32 (AB32)

Subsequent to the Governor's issuance of EO S-3-05, the California State Legislature adopted Assembly Bill (AB) 32 – The California Global Warming Solutions Act of 2006. AB 32 establishes a cap on statewide greenhouse gas emissions and sets forth the regulatory framework to achieve the corresponding reduction in statewide emissions levels. Specifically, AB 32 recognizes a serious threat to the “economic wellbeing, public health, natural resources, and the environment of California” that results from global warming. Consequently, AB 32 mandates a significant reduction in GHGs in order to contribute to efforts to stabilize atmospheric concentrations of GHGs. Specifically, AB 32 requires the California Air Resources Board (ARB) to do the following:

- By July 1, 2007, adopt a list of early action measures that can be implemented by regulation before January 2010.
- By January 1, 2008, adopt mandatory reporting requirements for significant sources.
- By January 1, 2008, establish a statewide GHG emission cap for 2020 based upon 1990 emissions levels.
- By January 1, 2009, adopt a plan (Scoping Plan) indicating how emission reductions will be achieved for significant GHG sources via regulations, market mechanisms, or other measures, to reach the 2020 emissions goal.
- By January 1, 2011, adopt regulations to achieve the maximum technologically feasible and cost effective reductions in GHG.

In addition, ARB is to:

- Convene an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee to advise ARB.
- Ensure public notice and opportunity for comments for all actions.
- Prior to imposing any mandates or authorizing market mechanisms, to evaluate several factors, including but not limited to: impacts on California's economy, the environment, and public health; equity between regulated entities; electricity reliability, conformance with other environmental laws, and to ensure that the rules do not disproportionately impact low-income communities.

For further information, see www.climatechange.ca.gov/ab32/index.html

Other key legislation:

- California Environmental Quality Act (CEQA): CEQA requires public agencies in California to analyze potential adverse impacts for proposed projects undertaken by a public agency, funded by a public agency, and requiring discretionary approval by a public agency. The fundamental purposes of CEQA are to inform governmental decision-makers and the public about the significant environmental effects of proposed activities, identify ways to avoid or significantly reduce environmental damage, use feasible alternatives or mitigation measures to avoid significant damage, and disclose to the public why a governmental agency approved a project if significant effects are involved (CEQA Guidelines §15002[a]). To disclose potential adverse impacts from a proposed project, pursuant to CEQA lead agencies typically prepare multidisciplinary environmental impact analysis and make decisions based on the analysis regarding the environmental effects of the proposed project (CEQA Guidelines §15002[a]). The guidelines are available at: <http://ceres.ca.gov/ceqa/guidelines/>
- Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions: In August 2007, Governor Schwarzenegger signed into law Senate Bill (SB) 97 – CEQA: Greenhouse Gas Emissions. SB 97 requires the Office of Planning and Research, by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency would be required to certify and adopt those guidelines by January 1, 2010. The Office of Planning and Research would be required to periodically update the guidelines to incorporate new information or criteria established by ARB pursuant to the California Global Warming Solutions Act of 2006. SB 97 also identifies a limited number of types of projects that would be exempt under CEQA from analyzing GHG emissions. Finally, the legislation will be repealed on January 1, 2010. For further information, see <http://opr.ca.gov/index.php?a=ceqa/index.html>
- Office of Planning and Research (OPR) Technical Advisory: Consistent with SB 97, on June 19, 2008, OPR released its *Technical Advisory on CEQA and Climate Change*, which was developed in cooperation with the Resources Agency, the California Environmental Protection Agency (Cal/EPA), and the ARB. The *Technical Advisory* offers the informal interim guidance regarding the steps lead agencies should take to address climate change in their CEQA documents, until CEQA guidelines are developed pursuant to SB 97 on how state and local agencies should analyze, and when necessary, mitigate greenhouse gas emissions (OPR).

According to OPR, lead agencies should determine whether greenhouse gases may be generated by a proposed project, and if so, quantify or

estimate the GHG emissions by type and source. Second, the lead agency must assess whether those emissions are individually or cumulatively significant. When assessing whether a project's effects on climate change are "cumulatively significant" even though project specific GHG contribution may be individually limited, the lead agency must consider the impact of the project when viewed in connection with the effects of past, current, and probable future projects. Finally, if the lead agency determines that the GHG emissions from the project as proposed are potentially significant, it must investigate and implement ways to avoid, reduce, or otherwise mitigate the impacts of those emissions.

On April 13, 2009, the Governor's Office of Planning and Research sent proposed amendments of the CEQA Guidelines to the Secretary of the Resources Agency for promulgation. The proposed amendments contain Model Policies for GHGs in General Plan. OPR recommended changes to fourteen sections of the existing guidelines, including: the determination of significance as well as thresholds; statements of overriding consideration; mitigation; cumulative impacts; and specific streamlining approaches. The proposed Guidelines also include an explicit requirement that environmental impact reports (EIRs) analyze GHG emissions resulting from a project when the incremental contribution of those emissions may be significant. A copy of the full proposal, as well as the letter of transmittal, may be found at: www.opr.ca.gov.

- SB 375 (Steinberg) Transportation, Land Use, and the California Environmental Quality Act (CEQA): On September 30, 2008, Governor Schwarzenegger signed into law SB 375 (Steinberg). SB 375 focuses on housing and transportation planning decisions to reduce fossil fuel consumption and conserve farmlands and habitat. This legislation is important to achieving AB 32 goals because greenhouse gas emissions associated with land use, which includes transportation, are the single largest sector of emissions in California. Further, SB 375 provides a path for better planning by providing incentives to locate housing developments closer to where people work and go to school, allowing them to reduce vehicle miles traveled every year. Finally, SB 375 provides certain exemptions under CEQA law for projects that are proposed consistent with local plans developed under SB 375. The bill is available here: http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.html

1.3 California Environmental Quality Act (CEQA)

The California Legislature enacted CEQA in 1970. CEQA is intended to address a broad range of environmental issues, including water quality, noise, land use, natural resources, transportation, energy, human health, biological species, and air quality. CEQA requires that public agencies (i.e., local, county, regional, and state government) consider and disclose the environmental effects of their decisions to the public and governmental decision makers. Furthermore, CEQA mandates that agencies implement feasible mitigation measures or alternatives that would mitigate significant adverse effects on the environment. A significant effect on the environment is defined as a substantial adverse change in the physical conditions which exist in the area affected by the proposed project. This determination of significance must be based on the substantial evidence in light of all the information before the agency.



1.4 The District's Role in the CEQA Review Process



The District has jurisdiction over most air quality matters in the San Joaquin Valley Air Basin and is tasked with implementing certain programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. As parts of the effort to accomplish its mandates, the District has prepared plans to attain national and state ambient air quality standards, conducts a CEQA review program, and maintains a staff of technical personnel versed in air pollution analysis and control. In addition, CEQA

Guidelines §15004(b)(2) require a lead agency to consult with *"Any other state, federal, and local agencies which have jurisdiction by law with respect to the project or which exercise authority over resources which may be affected by the project...."*

Nearly all development projects in the San Joaquin Valley Air Pollution Control District, from general plans to individual development applications, have the potential to generate pollutants that will worsen air quality or make it more difficult for national and state air quality attainment standards to be attained. Therefore, for most projects, it is necessary to evaluate air quality impacts to comply with CEQA.

As a public agency, the District takes an active part in the intergovernmental review process under CEQA. The District is available to assist governmental agencies and project proponents in understanding how to characterize project related impacts on air quality and how to mitigate those impacts. The District provides technical guidance on applicable air quality analysis methodologies, identifies applicable rules, proposes mitigation measures, and helps address any other air quality related issues.

In carrying out its duties under CEQA, performs several agency roles: the District may act as a Lead Agency, a Responsible Agency, or a “Commenting” Agency. As discussed below, the role the District serves under CEQA is dependent upon the extent of the District’s discretionary approval power over the project.

Lead Agency – A Lead Agency is the public agency with the principal responsibility for carrying out or approving a project subject to CEQA. Lead Agencies are responsible for complying with CEQA by ensuring that the potential environmental impacts of projects are adequately assessed. This may include determining that a project is exempt from CEQA, or preparing a Negative Declaration, or an Environmental Impact Report (EIR) for nonexempt, potentially significant projects. Lead Agencies must also consult with and solicit comments from responsible and commenting agencies during the preparation of a Negative Declaration or EIR.

In general, the local government agency with jurisdiction over land use, such as a city or county, is the preferred Lead Agency for land development projects. The District will undertake the Lead Agency role when no other agency has broader responsibility for approving the project; the project requires a discretionary District permit; and no other agency has prepared (or is preparing) a CEQA document for the project. In addition, the District routinely serves as Lead Agency for its own projects, such as the development of rules and regulations.

Responsible Agency – A Responsible Agency is a public agency, other than the Lead Agency, that has responsibility for carrying out or approving a project. The role of a Responsible Agency is different from that of a Lead Agency. While a Lead Agency must consider all of the potential impacts of a project, a Responsible Agency may only consider those aspects that are within the agency’s area of expertise or which are required to be carried out or approved by the agency. A Responsible agency complies with CEQA by considering the Negative Declaration or EIR prepared by the Lead Agency and by reaching its own conclusion on whether or how to approve the project involved.

The District is typically a Responsible Agency for projects or portions of a project that require a District permit, or that require any other approval by the District. When considering the lead agency’s environmental analysis, the District will review the air quality section of the analysis and other sections relevant to assessing potential impacts on air quality, i.e. sections assessing traffic and public health impacts. At the conclusion of its review, the District may submit comments to the

lead agency that identify any deficiencies in the air quality analysis and suggest approaches to correct the deficiencies. Where appropriate, the District may recommend additional feasible mitigation measures.

Commenting Agency – Under CEQA, an agency that has “jurisdiction by law” over a particular natural resource, but does not have discretionary approval over the project is a “Trustee Agency”, otherwise known as a “Commenting Agency”. The District serves as a Commenting Agency when reviewing projects which typically do not require air permits, e.g. residential and commercial development projects. In addition to the air quality section, the District may review and comment on other sections of the environmental document that relate to air quality impacts, e.g. traffic, health risks, etc. When serving as a Commenting Agency, the District may provide the Lead Agency comments on the adequacy of the air quality analysis; identify District rules which apply to the project, and may recommend potential mitigation measures for the Lead Agency’s consideration.

Identifying significant air quality impacts and mitigation early in the development of a project will allow fundamental design changes for the benefit of air quality at the lowest possible cost. The District is available for consultation at any time during the project review process, but there are certain times when consultation is required. For example, when the District has discretionary approval authority over a project for which another public agency is serving as Lead Agency, the District is to be consulted as a Responsible Agency. When the District does not have any discretionary approval authority over a project, but the project may impact air quality, the District is to be consulted as a Commenting Agency.

1.5 CEQA and GHG Emissions

General scientific consensus and increasing public awareness regarding global warming and climatic change have placed new focus on the CEQA review process as a means to address the effects of GHG emissions from proposed projects on climatic change. Senate Bill 97, as discussed above, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA



analysis. It directs the Governor's Office of Planning and Research to develop draft CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of green house gas emissions" by July 1, 2009 and directs the Resource Agency to certify and adopt CEQA Guidelines by January 1, 2010. However, at this time there are no generally accepted thresholds of significance for determining the impact of GHG emissions from an individual project on global climatic change.

Although AB 32 gives wide responsibility to ARB to regulate GHG emissions from all sources, including non-vehicular sources, it does not preempt or excuse permitting agencies from addressing GHGs under CEQA. Under state law, it is the purview of each lead agency to determine what, if any, significance thresholds will be established to guide its review of projects under CEQA. Traditionally, the District has provided local lead agencies technical guidance for assessing a project's potential impact on air quality, including establishment of significance thresholds for criteria pollutants. The District's Climate Change Action Plan is being developed consistent with the District's traditional role of providing local lead agencies technical guidance for assessing a project's potential impact on air quality, including establishment of significance thresholds for criteria pollutants.

CHAPTER 2

CLIMATE CHANGE ACTION PLAN MISSION

2.1 Purpose of the Climate Change Action Plan

California's Global Warming Solutions Act of 2006 (AB 32) includes a large number of initiatives to reduce GHG emissions state wide. These initiatives are discussed in ARB's AB 32 Scoping Plan, which was approved for adoption by ARB in December 2008.

AB 32 and the AB 32 Scoping Plan do not yet impose direct mandates on local Air Districts. However, the draft AB 32 Scoping Plan includes mandates on land use agencies and businesses which often look to the District for technical assistance. As such, the District can play a supportive role and be a leader in facilitating compliance with AB 32 for Valley land use agencies and businesses.

What is
the plan?



The goals of the CCAP are to establish District processes for assessing the significance of project specific GHG impacts for projects permitted by the District; assist local land use agencies, developers, and the public by identifying and quantifying GHG emission reduction measures for development projects and by providing tools to streamline evaluation of project specific GHG effects; ensure that collateral emissions from GHG emission reduction projects do not adversely impact public health or environmental justice communities in the Valley; and assist Valley businesses in complying with state law related to GHG emission reduction. For other agencies, including lead agencies, the proposed process for assessing project specific significance is offered as guidance and is not to be interpreted as a mandate.

The District believes that thoughtful and well documented guidance by the District designed to help local land-use agencies to properly address climate change issues in the CEQA documents, and assistance by the District in identifying and implementing GHG mitigation measures, can be beneficial by bringing structure and relative certainty to the CEQA process.

The District can also assist Valley businesses in complying with AB 32 requirements in other ways. The District's long-standing relationship with Valley businesses has yielded a comprehensive regulatory infrastructure that we hope to use to facilitate efficient and streamlined compliance with many of the upcoming AB 32 requirements.

2.2 District Governing Board CCAP Mandates

In August 2008 the District's Governing Board adopted the Climate Change Action Plan (CCAP). The CCAP authorized the Air Pollution Control officer (APCO) to develop guidance documents to assist land use agencies and other permitting agencies in addressing GHG emissions as part of the CEQA process, investigate the development of a greenhouse gas banking program, enhance the existing emissions inventory process to include greenhouse gas emissions reporting consistent with new state requirements, and administer voluntary greenhouse gas emission reduction agreements. Except for the latter two, which can be implemented immediately, the APCO's recommendations for accomplishing these initiatives would then be brought before the Governing Board for their additional consideration.

The balance of this staff report focuses solely on various issues concerning the development of District guidance for addressing project related greenhouse emissions during the CEQA process. This paper does not address the other items called for in the CCAP.

2.2.1 Greenhouse Gas Guidance for CEQA

CEQA requires lead agencies to identify potentially significant effects on the environment of projects they intend to carry out or approve and to mitigate significant effects whenever it is feasible to do so.

For projects with GHG emissions, determining if the GHG emissions are significant involves three steps:

- Identify and quantify GHG emissions.
- Assess the significance of the GHG emissions on the environment.

- If the GHG emissions are found to be significant, identify alternatives and/or mitigation measures that will reduce the impact of the GHG emissions below significance.

The CCAP authorizes the APCO to develop guidance and procedures for assessing the significance of project-related GHG emissions. By establishing a GHG significance level, or developing some alternative method to address GHG impacts, the uncertainty of characterizing the impacts on GCC during the CEQA process will be reduced for both lead agencies and project proponents. Also, for projects that are determined to have significant GHG emissions, or otherwise require GHG mitigation to reduce or offset the GHG emissions, sources of potential and approvable GHG mitigation must be clearly identified.

2.2.2 Carbon Exchange Program

The CCAP authorized the APCO to develop regulations and procedures for a greenhouse gas emission reduction banking system. This voluntary banking system, the San Joaquin Valley Carbon Exchange (SJVCE), would provide a mechanism for the voluntary banking of GHG emission in the San Joaquin Valley.

The outcome of stakeholder meetings will be considered when determining if the SJVCE should be developed. At the conclusion of such meetings, the District may determine that a rule to establish a SJVCE should be developed or that a SJVCE is not warranted.

A District administered GHG banking system may be beneficial to stakeholders in the District for the following reasons:

- Banked GHG emission reductions could be used to provide mitigation for CEQA,
 - GHG emission reductions could possibly be used for compliance with AB32,
 - Promote the early reductions of GHGs and their associated criteria and toxic pollutants in the District (especially in environmental justice areas),
 - Provide a mechanism for the trading of GHG emission reductions,
 - Provide a measure of certainty of banked GHG emission reductions due to the District's extensive experience in banking criteria pollutant emissions, and
 - Provide a mechanism for persons to purchase and retire banked GHG emission reductions for societal benefit.

The goals would be to provide a mechanism to preserve high quality greenhouse gas (GHG) emission reductions and encourage such reductions that have no or minimal collateral criteria or toxic pollutant emission increases, or in fact that create co-beneficial reductions in such emissions.

A SJVCE technical workgroup consisting of District staff, land use agency representatives, industry representatives, agricultural representatives, environmental group representatives, and other interested parties was formed to study the feasibility and need for the SJVCE. This group met three times in late 2008 and early 2009. In parallel to this effort, this workgroup developed a "Report to the APCO Regarding Development of the San Joaquin Valley Carbon Exchange". Currently, the development of a GHG emission reduction registry is being addressed via amendments to Rule 2301 *Emission Reduction Credit Banking*. The latest version of the report and related information to the progress of Rule 2301 are available at http://www.valleyair.org/Programs/CCAP/CCAP_idx.htm.

2.2.3 Voluntary Greenhouse Gas Mitigation Agreements

The CCAP authorizes the APCO to develop guidance and procedures for implementing a program by which project proponents can voluntarily enter into contractual arrangements with the District to fund projects, mitigating their projects cumulative impact on GCC. CEQA Guidelines clearly recognize the use of fee payments as mitigation for a project's otherwise cumulatively significant impacts. A project's contribution is less than cumulatively significant if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact (CEQA Guidelines § 15130, subd. (a)(3)).

The District has considerable experience with the use of voluntary emission reduction agreements to mitigate impacts of criteria pollutants. In the past, the District has used its grant program (Emissions Reduction Incentive Program), to successfully mitigate impacts of criteria pollutants resulting from growth and development projects occurring within the San Joaquin Valley. To date, the program has resulted in permanent emission reductions totaling 1,074.57 tons NOx, 42.51 tons PM and 125.76 tons of VOC. The District's current mitigation program could readily be expanded to include mitigation of GHG emissions.

Conceptually, project proponents required to mitigate their GHG emissions as part of the CEQA process would enter into voluntary mitigation agreements with the District. Each mitigation agreement would be subject to Governing Board approval. Under such a voluntary agreement, the project proponent would provide funding to the District in amounts necessary to obtain the needed reduction in GHG emissions. The District would accept funds from project proponents and through its grant program fund projects that would achieve the required GHG emission reductions.

The cost of bringing about GHG emission reductions can vary widely. In determining which projects to fund, priority would likely be given to those projects that are the most cost effective. Projects that also result in reductions of criteria and toxic air pollutants, and are located in environmental justice areas would be given priority in the funding process. Funds from individual mitigation agreements could be pooled together to provide sufficient funding for large GHG emission reduction projects. When the emission reduction projects are implemented by the grant recipients, the emissions reductions monitored, verified, and enforced by the District, thus guaranteeing that the mitigation does indeed occur.

Separately, the California Attorney General (AG) has required some projects to mitigate their GHG emissions through the payment of mitigation funds. In fact, for several projects in the District, the District may enter into memorandums of understanding (MOUs) with the AG to accept these funds and obtain GHG emission reductions on behalf of the project proponent.

District staff is currently preparing an analysis of potential GHG reduction projects that might be funded through grants administered by the District. This analysis will include individual project-types, their potential for generating GHG reductions, the cost effectiveness of the reductions, and an assessment of various criteria for considering collateral criteria emission reduction benefits (i.e., how to recognize the benefits of projects that reduce both GHG and criteria pollutants).

2.3 Proposed Timeline and Method to Achieve the CCAP Goals



The District held its first CCAP scoping meeting on November 18, 2008. During this meeting, the District presented the objectives of the proposed CCAP and solicited volunteers to participate in the GHG CEQA Guidance technical workgroup. To receive the broadest input possible, the District sought participation from industry representatives, local Land Use Agency members, other Public Agency members, environmental group representatives and any other interested party.

Three ad hoc committees were formed to evaluate the project scope and quantify GHG emissions resulting from one industrial and one non-industrial project, and to provide guidance/recommendation to be applied when determining the significance and mitigation of project specific GHG emissions during the CEQA environmental review process. Numerous discussions were coordinated on these key issues over 16 conference calls and meetings that were held between December 2008 and March 2009.

District staff conducted a public workshop on May 5 and June 30, 2009 to present, discuss, and receive comments on District's draft guidance for addressing GHG under CEQA. The public hearing is tentatively scheduled to take place in the last quarter of 2009. This staff report for the proposed CCAP containing District's recommendation to the APCO will be revised, published and mailed to affected sources and interested parties prior to a public hearing to consider the adoption of proposed guidance by the District Governing Board.

CHAPTER 3

CURRENT STATUS: ADDRESSING PROJECT GHG IMPACTS

3.1 Introduction

Public agencies, including the California Air Resources Board, and other air districts, are striving to determine the appropriate means by which to evaluate the impact of GHG emissions at the project level. The following discussion summarizes various approaches and methodologies for addressing GHG emissions, as well as possible mitigation measures that are being considered.

The following sections summarize the activities of various agencies and groups concerning the role of GHGs in the CEQA process.

3.2 Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has made available a large volume of information on greenhouse gases including their nature, impact, emissions inventory, and emissions trend and projections. However, none of the available information addresses or evaluates specific approaches on how to comply with the CEQA requirements, as CEQA is a California-specific law.



It is important to note that EPA has published an Advanced Notice of Proposed Rulemaking: Regulating Greenhouse Gas Emissions under the Clean Air Act (<http://www.epa.gov/climatechange/anpr.html>). This notice asks for public input on the appropriateness of regulating GHGs under the Federal Clean Air Act, and if appropriate, the form that regulation would take. The comment deadline for this notice was November 28, 2008. EPA is not expected to act further on this notice anytime soon, but because activities on the federal level have the potential to

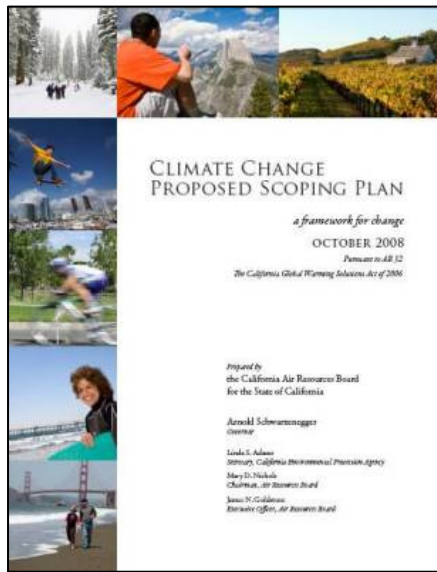
circumvent or replace local actions, all interested parties should watch and participate in this federal process.

In addition, after a thorough scientific review ordered in 2007 by the U.S. Supreme Court EPA issued in April 17, 2009 a proposed finding that greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride) contribute to air pollution that may endanger public health or welfare. This proposed finding is now under a public comment period.

3.3 California Air Resources Board (ARB)

3.3.1 ARB Scoping Plan

ARB developed a scoping plan addressing AB 32 requirements according to specific deadlines. The AB 32 Scoping Plan² contains the main strategies California will use to reduce greenhouse gases (GHG) that cause climate change. The Scoping Plan has a range of GHG reduction actions which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. The Proposed Scoping Plan was released on October 15, 2008 and approved at ARB's Board hearing on December 12, 2008. The Scoping Plan now requires ARB and other state agencies to adopt regulations and other initiatives reducing GHGs. The majority of the work must be completed by December 31, 2010 with most regulations and other initiatives going into effect by January 1, 2012.



The scoping plan contains the main strategies California will use to reduce greenhouse gases (GHG) from business-as-usual emissions projected from 2020 levels back down to 1990 levels. Business-as-usual (BAU) is the projected emissions in 2020, including increases in emissions caused by growth, without any greenhouse gas reduction measures. The Scoping Plan has a range of GHG reduction actions which include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

² *Climate Change Proposed Scoping Plan*. California Air Resources Board, October 2008

3.3.2 GHG Baseline and Business-as-Usual Emissions

Senate Bill 1771 directed the California Energy Commission (CEC) to determine the statewide GHG emissions inventory by January 2002 and to update it every five years thereafter. As of January 1, 2007, the responsibility for updating the GHG inventory was transferred to ARB per Assembly Bill 1803.

Baseline

The California Air Resources Board (CARB) used its emission inventory to establish the Baseline upon which changes in GHG emissions would be evaluated. The Baseline consists of a three-year average for GHG emissions occurring by sector during the baseline period of 2002-2004. The Baseline Period GHG emissions include emissions from all sources in ARB's emissions inventory, including both, old and new, large and small GHG emission sources.

Business-as-Usual

Business-as-usual (BAU), as established by CARB, is a projected emissions inventory and does not represent actual business or operational practices generating GHG emissions. To establish BAU, ARB projected the Baseline Period emissions to the year 2020, using assumptions about potential growth, assuming no change in the existing business practices, and without considering implementation of any GHG emission reduction measures.

ARB 29%GHG Emission Reduction Target

As presented in the Scoping Plan³, ARB estimated the 2020 BAU greenhouse gas emissions to be 596 MMTCO₂E. The State's GHG emissions level in 1990 was approved by ARB in December 2007 to be 427 MMTCO₂E. This sets the 2020 GHG emissions target. The resulting BAU estimate of 596 MMT is compared to the 2020 target of 427 MMT to determine the total statewide GHG reductions needed. The 2020 target of 427 MMTCO₂E requires the reduction of 169 MMTCO₂E, or approximately 29%, from the state's projected 2020 BAU emissions and the reduction of 42 MMTCO₂E, or almost 10 percent, from 2002-2004 average emissions.

$$29\% \text{ Total Reduction} = \frac{596 \text{ MMTCO}_2\text{E} (2020 \text{ BAU Emissions}) - 427 \text{ MMTCO}_2\text{E} (2020 \text{ Target Emissions})}{596 \text{ MMTCO}_2\text{E} (2020 \text{ BAU Emissions})}$$

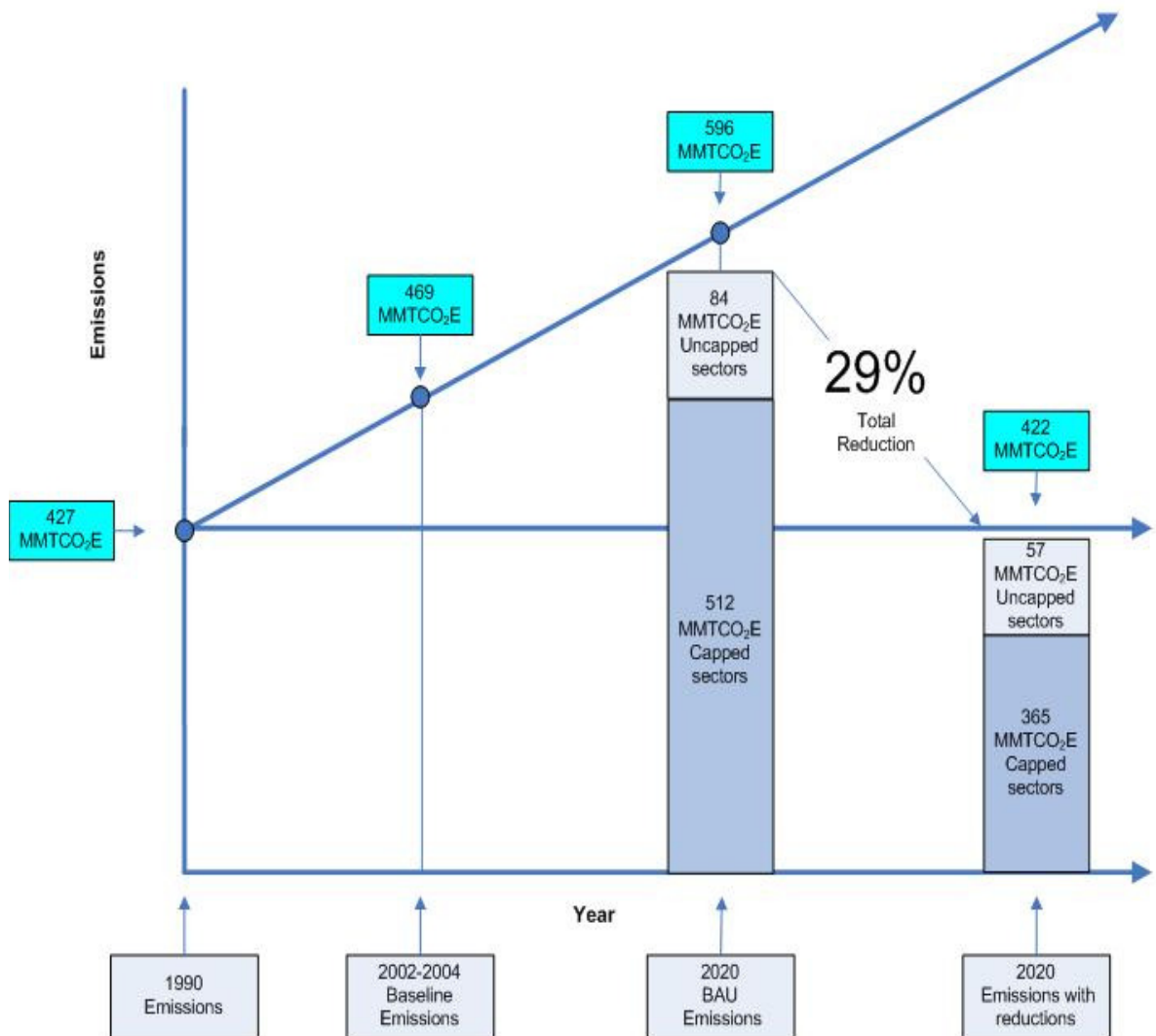
ARB has identified reduction measures totaling 174 MMTCO₂E in the Scoping Plan that would achieve reductions from sources within the cap-and-trade sectors (capped) by 146.7 MMTCO₂E and from sources not covered by cap-and-trade (uncapped) by 27.3 MMTCO₂E. With a total projected BAU emission by 2020 of 596 MMTCO₂E, the projected total

³ *Climate Change Proposed Scoping Plan*; P. 12 and 21. California Air Resources Board, October 2008

emission after reductions would be 422 MMTCO₂E of which 365 MMTCO₂E from capped sectors and 57 MMTCO₂E from uncapped sectors.

Figure 2 below illustrates the 1990 state's GHG emissions and 2020 reductions as proposed in the Scoping Plan⁴.

Figure 2: California Greenhouse Gas Emissions in 2020



Note: Emissions growth and proportions not to scale.

⁴ Climate Change Proposed Scoping Plan; P. 12 and 21. California Air Resources Board, October 2008

3.3.3 GHG Emission Reduction Measures and Cap-and-Trade Principles

The AB 32 Scoping Plan evaluated a comprehensive array of approaches and tools identifying GHG emission reduction measures to achieve the 1990 GHG emission level target. ARB concluded that reducing GHG emissions from a wide variety of sources can best be achieved through establishment of a cap-and-trade program. A cap-and-trade program establishes an enforceable limit (or cap) on the aggregate total emissions for those entities covered by the program.⁵ As proposed by ARB, the State would establish a cap for each compliance period of the program, and emission reductions would increase as the cap declines over time. A key component of a cap-and-trade program is a permit to emit one unit of GHG emissions, typically called an allowance. Allowances are issued in the program in an amount equal to the total emissions limit for a compliance period. At the end of the compliance period, all entities in a cap-and-trade program must surrender allowances equal to their total emissions during the compliance period.

The limited number of allowances issued creates a binding cap on emissions. The State would issue fewer allowances over time, thus ensuring declining emissions. Failure to surrender allowances equal to emissions results in significant penalties. New facilities that begin operation in sectors subject to cap-and-trade would be required to obtain allowances through an auction, from a reserve, or from other allowance holders. This process provides a mechanism for new facilities to operate, while guaranteeing that there is no increase in overall GHG emissions when new facilities are built.

The proposed cap-and-trade would include up to 85 percent of the State's emission sources by 2020, covering electricity, transportation fuels, natural gas, and industrial sectors. ARB estimates that, the cap-and-trade would reduce overall state-wide GHG emissions by 147 MMTCO₂E⁶ from projected BAU in 2020.

Cap-and-trade programs are market-driven, and do not specify how emission reductions will be achieved. Emissions reductions will be achieved at the facility level using the most cost-effective methods available. Emission reductions achieved through compliance with other emission reduction measures count towards achieving the facility's cap, thus reducing the need to obtain allowances. Furthermore reductions achieved on site have a potential collateral benefit of reducing criteria pollutant emissions.

⁵ For further discussion of cap-and-trade see: *Climate Change Proposed Scoping Plan Appendix C, Cap and Trade*, pp. 11 – 24. California Air Resources Board, October 2008

⁶ *Climate Change Proposed Scoping Plan*, pp. 16 and 21. California Air Resources Board, October 2008

3.3.4 ARB's Preliminary Recommendations for Significance Thresholds

On October 24, 2008, ARB released its Preliminary Draft Staff Proposal, *Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act*. ARB staff believes that zero thresholds are not warranted in light of the fact that (1) some level of emissions in the near term and at mid-century is still consistent with climate stabilization and (2) current and anticipated regulations and programs apart from CEQA will proliferate and increasingly will reduce the GHG contributions of past, present, and future projects. But any non-zero threshold must be sufficiently stringent to make substantial contributions to reducing the State's GHG emissions peak, causing that peak to occur sooner, and putting California on track to meet its interim (2020) and long-term (2050) emissions reduction targets.

The Proposed Scoping Plan was released on October 15, 2008 and approved at ARB's Board hearing on December 12, 2008. The Scoping Plan now requires ARB and other state agencies to adopt regulations and other initiatives reducing GHGs. The majority of the work must be completed by December 31, 2010 with most regulations and other initiatives going into effect by January 1, 2012.

A key aspect of ARB's approach is to recognize that different GHG thresholds of significance may apply to projects in different sectors. Two primary reasons that sector-specific thresholds are appropriate are: (1) some sectors contribute more substantially to the problem, and therefore should have a greater obligation for emissions reductions, and, (2) looking forward, there are differing levels of emissions reductions expected from different sectors in order to meet California's climate objectives. ARB also believes that different types of thresholds – quantitative, qualitative, and performance-based – can apply to different sectors under the premise that the sectors can and must be treated separately given the state of the science and data. A sector-specific approach is consistent with ARB's proposed Scoping Plan.

Stationary Sources

ARB staff's objective is to develop a threshold of significance that will result in the vast majority (~90% statewide) of the greenhouse gas (GHG) emissions from new stationary source projects being subject to CEQA's requirement to impose feasible mitigation. ARB staff believes this can be accomplished with a threshold that allows small projects to be considered insignificant. ARB staff used existing data for the industrial sector to derive a proposed hybrid threshold. The threshold consists of a quantitative threshold of 7,000 metric tons of CO₂ equivalent per year (MTCO₂E/year) for operational emissions (excluding transportation), and performance standards for construction and transportation emissions (CARB). The goal

of this effort is to provide for the mitigation of GHG emissions from industrial projects on a statewide level. Over time, implementation of AB 32 will reduce or mitigate GHG emissions from stationary sources. Once such requirements are in place, they could become the performance standard for stationary projects for CEQA purposes. ARB staff intends to pursue this approach in conjunction with development of the regulatory requirements for stationary sources in the Proposed AB 32 Scoping Plan. Staff is proposing the use of a quantitative significance threshold at least until such time that performance standards, such as AB 32 regulatory requirements, are in place to ensure mitigation of significant impacts of GHG emissions from projects in the industrial sector.

ARB determined that GHG emissions from stationary sources are dominated by combustion emissions. To ensure that significant stationary emissions would be captured by the proposed threshold, ARB staff evaluated industrial boilers because they are a very common piece of equipment, are essential in many energy-intensive industries, and are a top contributor to stationary combustion emissions. A recent comprehensive survey of industrial boilers found that boilers with an input capacity of 10 MMBtu/hr or greater correspond to 93 percent of total industrial boiler input capacity. Based on this data, ARB staff used a natural gas boiler input capacity benchmark of 10 MMBtu/hr which equates to emissions of 4,660 MTCO₂E/yr. This capacity benchmark defines a significant combustion source. Per ARB's analysis, combustion processes account for 63 percent of the statewide GHG emissions from industrial facilities. Process losses, purchased electricity, and water use and water treatment account for the remaining 27 percent of emissions.

Based on the available data, ARB concludes in its draft proposal that the 7,000 MTCO₂E/year benchmark can be used to effectively mitigate industrial projects with significant GHG emissions.

Residential and Commercial Developments

ARB's preliminary draft proposal for residential and commercial projects recognizes the potential for using a performance standard based approach. Projects complying with a previously approved plan that addresses GHG emissions, satisfies CEQA section 15064(h)(3), and that has all of the following attributes could be presumed to have a less than significant impact:

- Project meets a community level GHG target consistent with statewide AB 32 emission limits; and
- Is consistent with a transportation related GHG reduction target adopted by ARB pursuant to SB 375; and
- Includes a GHG inventory and mechanisms to regularly monitor and evaluate emissions; and
- Includes specific enforceable GHG requirements; and

- Incorporates mechanisms that all the plan to be revised to meet targets; and
- Has a certified final CEQA document.

Projects failing to meet the above criteria would go through a second tier analysis. As proposed, Tier II would contain both performance standards and a numerical (X) significance threshold. Projects could be presumed to have a less than significant impact if they met the following minimum performance standards and were below the X threshold of significance:

- Meets an interim ARB performance standard for construction related emissions; and
- Meets an energy use performance standard defined as CEC's Tier II energy efficiency goal; and
- Meets an interim ARB performance standard for water use; and
- Meets an interim ARB performance standard for waste; and
- Meets an interim ARB performance standard for transportation; and
- The project, with performance standards or equivalent mitigation would emit no more than X metric tons CO₂E/year.

It should be noted that ARB has solicited comments regarding whether to include an X factor. As of today, ARB has not finalized its recommendation, and has not scheduled any additional workshops or hearings on the draft proposals.

3.4 Office of Planning and Research (OPR)

OPR Recommendations

On or before January 1, 2010, The Governor's Office of Planning and Research (OPR) will develop, and the California Resources will certify and adopt amendments to the Guidelines providing regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the state CEQA Guidelines for greenhouse gas emissions, as required by Senate Bill 97 (Chapter 185, 2007). These proposed CEQA Guideline amendments would provide guidance to public agencies regarding the analysis and mitigation of the effects of greenhouse gas emissions in draft CEQA documents. The Natural Resources Agency will conduct formal rulemaking in 2009, prior to certifying and adopting the amendments, as required by Senate Bill 97.



In the interim, OPR has drafted and released in January 2009 draft amendments to the CEQA Guidelines for GHG emissions as required by SB97. OPR does not identify a threshold of significance for greenhouse gas emissions, nor have they prescribed assessment methodologies or specific mitigation measures. The

proposed language was added for clarification and stayed within CEQA's framework. The preliminary draft amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence.

General Guidance

Per the OPR, *"until such time as further state guidance is available on thresholds of significance, public agencies should consider the following general factors when analyzing whether a proposed project has the potential to cause a significant climate change impact on the environment"*.

Identify GHG Emissions

Lead agencies should make a good-faith effort, based on available information, to calculate, model, or estimate the amount of CO₂ and other GHG emissions from a project, including the emissions associated with vehicular traffic, energy consumption, water usage and construction activities.

Determine Significance

As with any environmental impact, lead agencies must determine what constitutes a significant impact. In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a "significant impact", individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice. The potential effects of a project may be individually limited but cumulatively significant. Lead agencies should not dismiss a proposed project's direct and/or indirect climate change impacts without careful consideration, supported by substantial evidence. Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment. CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less than significant level as a means to avoid or substantially reduce the cumulative impact of a project, encourages reliance on other Environmental Impact Reports that discuss greenhouse gases, and tiering from them. The preliminary draft amendments OPR issued included an introduction letter in which OPR indicated that OPR intends to rely on ARB to recommend a method for setting significance thresholds. The draft guidelines add a new section 15064.4 titled "Determining the Significance of GHG Emissions", and it includes a suggestion of situations that might be considered significant.

Mitigate Impacts

Mitigation measures will vary with the type of project being contemplated, but may include alternative project designs or locations that conserve energy and water, measures that reduce vehicle miles traveled (VMT) by fossil-fueled vehicles, measures that contribute to established regional or programmatic mitigation strategies, and measures that sequester carbon to offset the emissions from the project. The lead agency must impose all mitigation measures that are necessary to reduce GHG emissions to a less than significant level. However, CEQA does

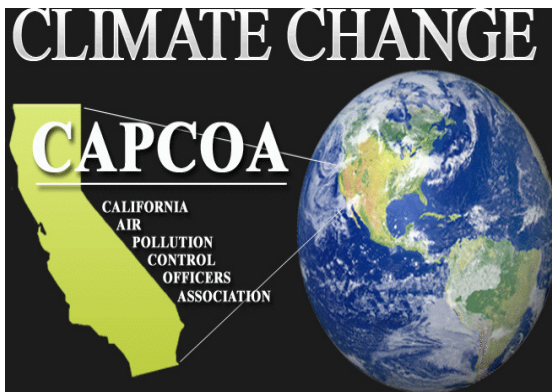
not require mitigation measures that are infeasible for specific legal, economic, technological, or other reasons, and a lead agency is not responsible for wholly eliminating all GHG emissions from a project; the CEQA standard is to mitigate to a level that is “less than significant”. If there are not sufficient mitigation measures that the lead agency determines are feasible to achieve the less than significant level, the lead agency should adopt those measures that are feasible, and adopt a Statement of Overriding Considerations that explains why further mitigation is not feasible or when an agency makes a statement of overriding considerations, the agency may consider local adverse environmental effects in the context of region-wide or statewide benefits. Agencies are encouraged to develop standard GHG emission reduction or mitigation measures that can be applied on a project-by-project basis.

Land Use Considerations

Local governments with land use authority are beginning to establish policies that result in land use patterns and practices that will result in less energy use and reduce GHG emissions. For example, some cities and counties have adopted general plans and policies that encourage the development of compact, mixed use, transit-oriented development that reduces VMT; encourage alternative fuel vehicle use; conserve energy and water usage; and promote carbon sequestration. Models of such developments exist throughout the state. For local government lead agencies, adoption of general plan policies and certification of general plan EIRs that analyze broad jurisdiction-wide impacts of GHG emissions can be part of an effective strategy for addressing impacts and for streamlining later project-specific CEQA reviews.

3.5 California Air Pollution Control Officers Association (CAPCOA)

CAPCOA – White Paper: CEQA and Climate Change



The intent of CAPCOA’s White Paper is to serve as a resource for public agencies as they establish procedures for reviewing GHG emissions from projects under CEQA. It considers the application of thresholds and offers three alternative programmatic approaches toward determining whether GHG emissions are significant. Although the White Paper considers an option of not establishing a GHG significance threshold, as already

noted this option is not considered to be a viable approach and will not be considered further. Ultimately, the White Paper is intended to provide consistent approaches for public agencies to ensure that GHG emissions are appropriately considered and addressed under CEQA (CAPCOA).

The CAPCOA White Paper identifies three programmatic approaches to establishing GHG significance thresholds and also discusses the benefits and problems associated with each approach. Each approach has inherent advantages and disadvantages. The basic approaches are:

- GHG emissions threshold set at zero; or
- GHG threshold set at a non-zero level (AB32 Goals)
- GHG threshold set at a non-zero level (Tiered Approach)

Zero Threshold

An air district or lead agency may determine that any degree of project-related increase in GHG emissions would contribute considerably to climate change which, therefore, would be considered a significant impact. As a result, the air district or lead agency could adopt a zero-emission GHG threshold. If the zero threshold option is chosen, the lead agency would be required to quantify and mitigate GHG emissions for all projects subject to CEQA, regardless of the size of the project or the availability of GHG reduction measures available to reduce the project's emissions. Projects that could not meet the zero-emission threshold would be required to undergo an environmental impact report CEQA process to disclose the unmitigable significant impact, and develop the justification for a statement of overriding consideration to be adopted by the lead agency.

Non-Zero Threshold – Statute and Executive

The first non-zero GHG significance threshold approach is based on achieving the objectives of AB 32 or Executive Order S-3-05 and explores four possible options under this scenario. A project would be required to meet the target objectives, or reduce GHG emissions to the target objectives, to be considered less than significant. The options under this approach are variations of ways to achieve the 2020 goals of AB 32 from new development, which is estimated to be about a 30 percent reduction from business-as-usual. The practical advantages of considering non-zero thresholds for GHG significance determinations can fit into the concept regarding whether the project's GHG emissions represent a "considerable contribution to the cumulative impact" and therefore warrant analysis.

Non-Zero Threshold – Tiered Threshold Options

The second non-zero GHG significance threshold approach is comprised of a number of tiered GHG significance threshold options. Within this option, the CAPCOA White Paper discusses several variations. The tiered threshold options offer both quantitative and qualitative approaches to setting a threshold, as well as different metrics for establishing the various tiers. Variations range from setting the first tier at zero to second tiers set at defined emission levels or based on the size of a project. This approach would then prescribe a set of GHG mitigation strategies that would have to be incorporated into the project in order for the project to be considered less than significant. CAPCOA notes that some applications of the tiered threshold approach may require inclusion in a General Plan or adoption of enabling regulations or ordinances to render them fully effective and enforceable.

CAPCOA offered to ARB on a letter dated January 9, 2009 two possible approaches regarding the issues associated with determining appropriate CEQA significance thresholds for GHG from new residential, commercial and industrial development. One suggested approach is to require all new stationary sources of GHG emissions to meet specific GHG performance standards established for each equipment type of source category of emissions. In addition, any new stationary source exceeding 25,000 tons of CO₂E per year after meeting the specified performance standards would be deemed to have a potentially significant adverse impact on the environment and would be analyzed and mitigated as required under CEQA.

The other suggested approach is that a jurisdiction could establish a CEQA significance threshold for stationary sources designed to capture and mitigate 90% of stationary source emissions. More details on the approaches can be found at: <http://www.valleyair.org/Programs/CCAP/1-9-09%20CAPCOA%20Letter%20on%20CEQA%20to%20Lynn%20Terry.pdf>.

3.6 Association of Environmental Professionals (AEP)

AEP – White Paper on Global Climate Change

AEP's White Paper was one of the first attempts to discuss GHGs in the context of CEQA. The intent of the White Paper was to provide practical, interim information to CEQA practitioners and to help Lead Agencies determine how to address GHGs and global climate change in CEQA documents prior to the development and adoption of guidance by appropriate government agencies. Further, AEP's White Paper provided a summary of the current regulatory environment surrounding GHG emissions, and the various approaches that a Lead Agency may select in a CEQA document to address the potential impacts of global climate change and a project's specific and cumulative contribution to GHG. The White Paper described several approaches for addressing GHGs and global Climate Change in CEQA documents, but did not recommend a single approach or methodology, leaving that decision to local Lead Agencies. The proposed approaches are summarized in the following bullet points.

Approach 1 – No Analysis: under this approach the Lead Agency would not mention or discuss GHGs or global climate change.

Approach 2 – Screening Analysis: under this approach the Lead Agency would establish a process to screen projects and determine that they would not make significant contributions to GHG emissions or GCC and, therefore, would not need to mitigate accordingly.

Approach 3 – Qualitative Analysis without Significance Determination: this approach involves a qualitative discussion of GHGs and global climate change and potential ways the project will contribute to the generation of GHG emissions, but does not provide any significance conclusions.

Approach 4 – Qualitative Analysis with Significance Determination: under this approach the Lead Agency would qualitatively discuss GHGs and climate change impacts and conclude whether the project impacts are significant.

Approach 5 – Quantitative Analysis without Significance Determination: under this approach the Lead Agency would quantify GHG emissions from the proposed project, but the results are not compared to a quantitative significance threshold.

Approach 6 – Quantitative Analysis with Net Zero Threshold: this approach involves quantifying GHG emissions and using zero net carbon dioxide equivalent increase as the threshold.

Approach 7 – Quantitative Analysis Relative to California GHG Emission Reduction Strategies: this approach employs both quantitative and qualitative components. The quantitative analysis contains an inventory of project GHG emissions. The qualitative component involves project compliance with the emission reduction strategies contained in the California Climate Action Team's (CAT) Report to the Governor, which contains recommendations and strategies to help ensure the targets in Executive Order S-3-05 are met.

Approach 8 – Use of Partial Exemption, “Within the Scope” of a Program EIR, or Tiering: this option relies on the preparation of a broad EIR on a plan, program, or zoning action that is certified and contains a cumulative GHG and global climate change impact analysis and mitigation. A later project that is consistent with the actions, goals, and/or policies in that plan, program, or zoning action need not again evaluate the cumulative impact regarding the project's GHG contribution to global climate change. In this situation, the later project may use the “partial exemption” provision of Public Resources Code §21083.3 and CEQA Guidelines §15183

While some of the approaches discussed above are dated and obsolete (such as those suggesting no analysis, or no determination of significance), the paper remains, in significant part, a valid and useful resource.

3.7 South Coast Air Quality Management District (SCAQMD)

SCAQMD has generally recommended a tiered decision tree approach to establishing a GHG significance threshold (SCAQMD) (See Figure 3). A tiered GHG significance threshold approach is an appealing approach because it provides flexibility in determining whether or not GHG emissions from a project are significant, typically using a single methodology to establish various tiers that can be based on the physical size of the project, land use type, or other characteristics. The tiered approach envisioned by SCAQMD would require quantification of GHG emissions for all projects that are subject to CEQA and quantification of the GHG reduction effectiveness of design parameters incorporated into the project and any mitigation measures imposed by the lead agency.



On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. SCAQMD recommended the interim GHG significance threshold proposal uses a tiered approach to determining significance. Tier 3, which is expected to be the primary tier by which the AQMD will determine significance for projects where it is the lead agency, uses the Executive Order S-3-05 goal as the basis for deriving the screening level. The Tier 3 screening level for stationary sources is based on an emission capture rate of 90 percent for all new or modified projects. A 90 percent emission capture rate means that 90 percent of total emissions from all new or modified stationary source projects would be subject to a CEQA analysis, including a negative declaration, a mitigated negative declaration, or an environmental impact report, which includes analyzing feasible alternatives and imposing feasible mitigation measures. Once ARB adopts the statewide significance thresholds, SCAQMD staff will report back to their Governing Board regarding any recommended changes or additions to the SCAQMD's interim threshold.

Tier 1 – consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. For example, SB 97 specifically exempts a limited number of projects until it expires in 2010. If the project qualifies for an exemption, no further action is required. If the project does not qualify for an exemption, then it would move to the next tier.

Tier 2 – consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan, for example. The concept embodied in this tier is equivalent to the existing concept of consistency in CEQA Guidelines §§15064(h)(3), 15125(d), or 15152(a). The GHG reduction plan must, at a minimum, comply with AB 32 GHG reduction goals; include emissions estimates agreed upon by either ARB or the SCAQMD, have been analyzed under CEQA, and have a certified Final CEQA document. Further, the GHG reduction plan must include a GHG emissions inventory tracking mechanism; process to monitor progress in achieving GHG emission reduction targets, and a commitment to remedy the excess emissions if AB 32 goals are not met (enforcement).

If the proposed project is consistent with the local GHG reduction plan, it is not significant for GHG emissions. If the project is not consistent with a local GHG reduction plan or there is no approved plan, the GHG reduction does not include all of the components described above, or there is no adopted GHG reduction plan, the project would move to tier 3.

Tier 3 – Establishes a screening significance threshold level to determine significance using a 90 percent emission capture rate approach as described above. The 90 percent capture rate GHG significance screening level in Tier 3 for stationary sources was derived using the following methodology. Using SCAQMD's Annual Emission Reporting (AER) Program staff compiled reported annual natural gas consumption for 1,297 permitted facilities for 2006 through 2007 and rank-ordered the facilities to estimate the 90th percentile of the cumulative natural gas

usage for all permitted facilities. Approximately 10 percent of facilities evaluated comprise more than 90 percent of the total natural gas consumption, which corresponds to 10,000 metric tons of CO₂ equivalent emissions per year (MTCOCO₂E/yr) (the majority of combustions emissions is comprised of CO₂). This value represents a boiler with a rating of approximately 27 million British thermal units per hour (mmBtu/hour) of heat input, operating at a 80 percent capacity factor. It should be noted that this analysis did not include other possible GHG pollutants such as methane, N₂O; a life-cycle analysis; mobile sources; or indirect electricity consumption. Therefore, when implemented, SCAQMD staff recommended interim proposal is expected to capture more than 90 percent of GHG emissions from stationary source projects. If the project exceeds the GHG screening significance threshold level and GHG emissions cannot be mitigated to less than the screening level, the project would move to Tier 4.

Tier 4 – Decision Tree Options: consists of three decision tree options to demonstrate that a project is not significant for GHG emissions. The compliance options are as follows:

Compliance Option 1 – the lead agency would calculate GHG emissions for a project using a Business As Usual (BAU) methodology. Once GHG emissions are calculated, the project proponent would need to incorporate design features into the project and/or implement GHG mitigation measures to demonstrate a 30 percent reduction from BAU.

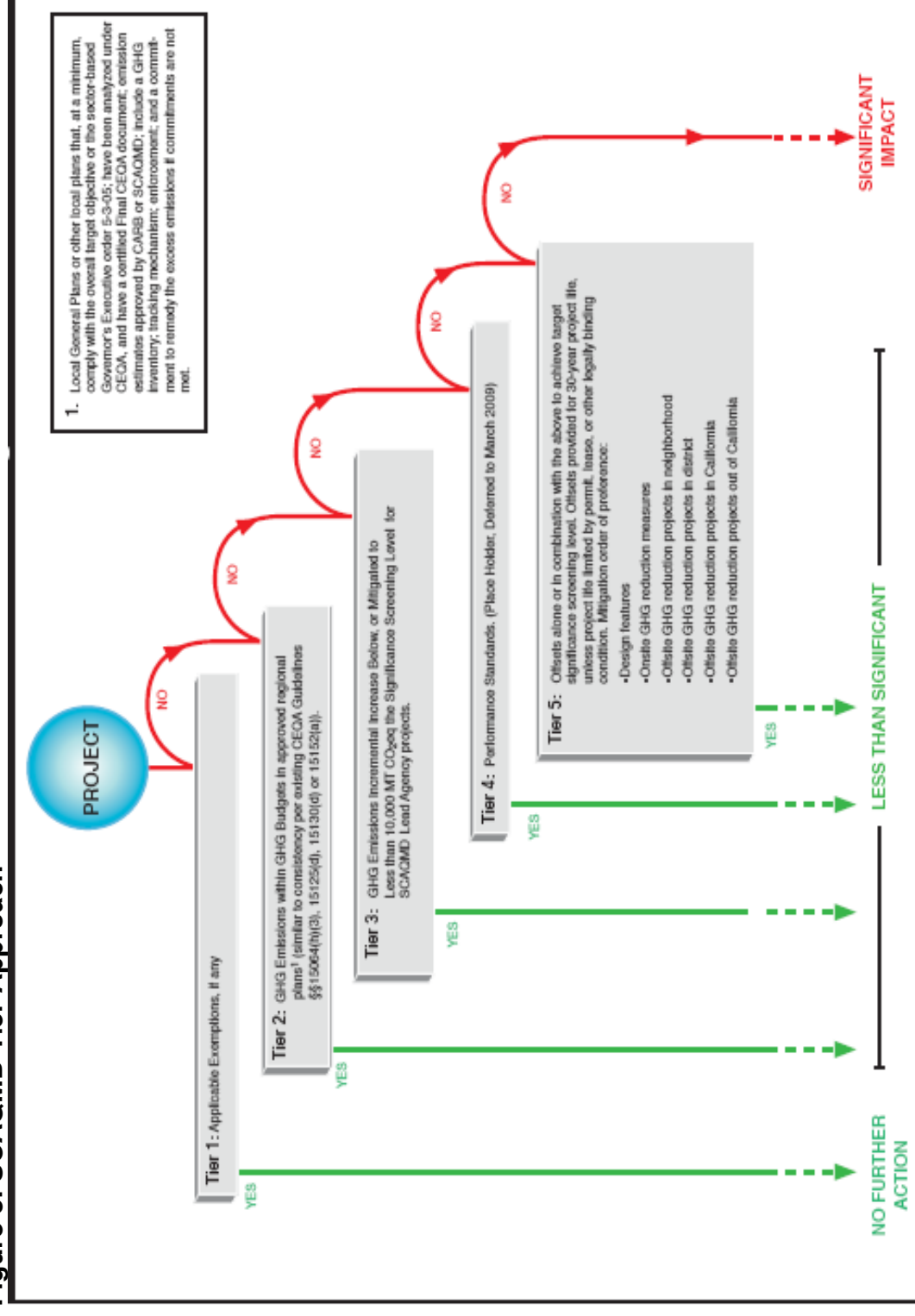
Compliance Option 2 – this option consists of early compliance with AB 32 through early implementation of ARB's Scoping Plan Measures. The intent of this compliance option is to accelerate GHG emission reductions from the various sectors subject to ARB's Scoping Plan to eliminate GHG emission.

Compliance Option 3 – this compliance option consists of establishing sector-based performance standards. For example, it may be possible to use the 1990 inventory required under AB 32 to establish an efficiency standard such as pounds per person, pounds per worker, pounds per square feet, pounds per item manufactured, etc. When calculating GHG emissions from a project, if they are less than the established efficiency standard the project would not be significant relative to GHG emissions, while projects exceeding the efficiency standard would be significant.

If the project proponent cannot achieve the performance standards on any of the compliance options in Tier 4, GHG emissions would be evaluated under Tier 5.

Tier 5 – under this tier, the lead agency would quantify GHG emissions from the project and the project proponent would implement offsite mitigation (GHG reduction projects) or purchase offsets to reduce GHG emission impacts to less than the proposed screening level. In addition, the project proponent would be required to provide offsets for the life of the project, which is defined as 30 years. If the project proponent is unable to obtain sufficient offsets, incorporate design features, or implement GHG reduction mitigation measures to reduce GHG emission impacts to less than the screening level, then GHG emissions from the project would be considered significant.

Figure 3: SCAQMD Tier Approach



Source: SCAQMD, 2008

3.8 Bay Area Air Quality Management District (BAAQMD)

On June 1, 2005 the Bay Area Air District Board of Directors adopted a resolution establishing a Climate Protection Program and acknowledging the link between climate protection and programs to reduce air pollution in the Bay Area. The Board of Directors also formed a standing Committee on climate protection to provide direction on District climate protection activities (BAAQMD). In April 2009, Bay Area AQMD prepared a draft report that evaluates options for California Environmental Quality Act (CEQA) thresholds of significance for use within BAAQMD's jurisdiction.



3.9 Sacramento Metropolitan Air Quality Management District (SMAQMD)



The Sacramento Metropolitan AQMD recommends that CEQA environmental documents include a discussion of anticipated GHG emissions during both the construction and operation phases of the project (SMAQMD). This recommendation is consistent with comments made by the previous and current California Attorney Generals on Land Use projects undergoing CEQA review. The Sacramento Metropolitan AQMD indicates that models are available to quantify GHG emissions from projects. In addition, the Sacramento Metropolitan AQMD offers several examples of type of

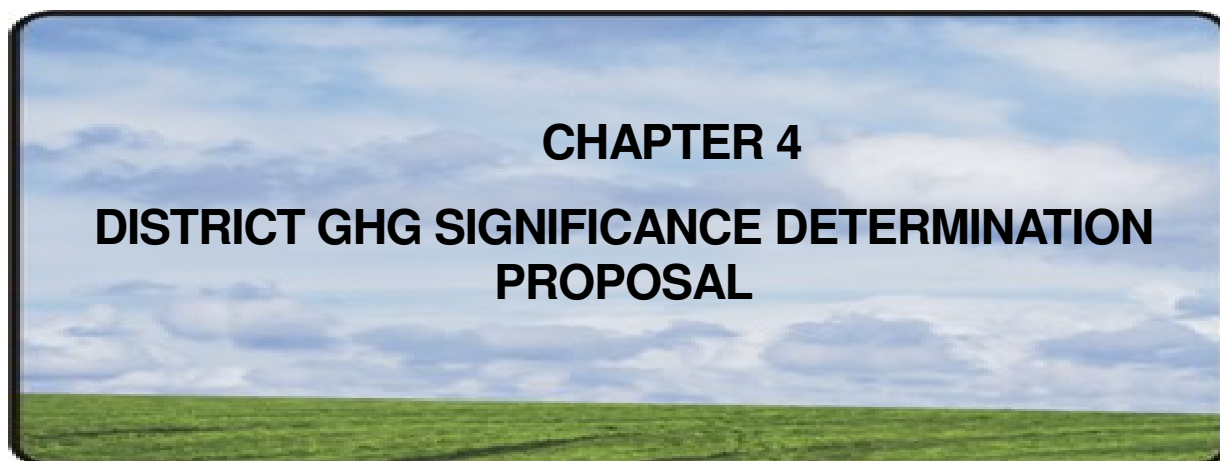
mitigations that local agencies may consider under CEQA to offset or reduce global warming impacts, and is currently developing a pilot project in which a development project proponent will be contributing fees to the District which will then use those funds in GHG mitigation projects.

3.10 San Joaquin Valley Air Pollution Control District CCAP Committees

As mentioned earlier, three ad hoc committees were created to assist in the guidance development for addressing GHG emissions during the CEQA process. They are (1) the Project Scope Committee, (2) the Level of Significance Committee, and the (3) Mitigation Measure Committee. The committee members included people with industrial, government, consulting, and environmental backgrounds and perspectives. Member lists are found in Appendixes A, B, and C. The committees developed a Guidance Issue Paper first and three progress reports subsequently, each focusing on a specific topic. The Guidance Issue Paper was used primarily to provide a starting point. The expanded discussion by the committees was conveyed in the progress reports and is incorporated here in the Appendixes D-G.



These issue papers do not necessarily represent the position or intention of the San Joaquin Valley Air District Pollution Control District, but are presented with this staff report to represent the input of the committee members themselves. Their assistance in the early stages of scoping and proposing various methods of addressing GHG emissions in CEQA was essential and appreciated.



4.1 Background

The obligation for public agencies to address the potential environmental effects of greenhouse gas (GHG) emissions arises from the California Environmental Quality Act (CEQA), which requires agencies to identify a project's potentially significant effects on the environment, and to mitigate significant effects whenever feasible. CEQA encourages public agencies to adopt "thresholds of significance" to use in determining the significance of environmental effects. A threshold of significance is an identifiable quantitative, qualitative or performance level of a particular environmental effect. Non-compliance with a threshold of significance would normally result in a determination that the project would have a significant environmental impact. Compliance with a significance threshold would normally result in a determination that project would not have a significant environmental impact.

Including evaluation of project related GHG emissions in CEQA evaluations is part of a rapid evolution of California State Climate policy, formalized, in part, with passage of Assembly Bill 32 (California Global Warming Solutions Act of 2006) (AB 32), Senate Bill 97 (CEQA: greenhouse gas emissions) (SB 97), and Senate Bill 375 (SB 375), commonly referred to in the popular press as the "climate change smart growth bill". Development of significance threshold for GHG emissions must be done in the context of these key legislative mandates.

AB 32 establishes the GHG emission reduction targets to be achieved by the State of California, and provides the framework for achieving those required reductions. AB 32 includes a number of specific requirements to be implemented by the California Air Resources Board (ARB), including preparation of a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions from sources or categories of sources of greenhouse gases by 2020.

SB 375 enhances ARB's ability to reach AB 32 goals by directing ARB to develop regional greenhouse gas emission reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. SB 375 also directs ARB to work with California's 18 metropolitan planning organizations to align their regional transportation, housing and land-use plans and prepare a "sustainable communities strategy" to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets. A key component of SB 375 is that ARB is required to establish GHG emission reduction targets for each region, as opposed to individual cities or households.



SB 97 requires the Governor's Office of Planning and Research (OPR) to develop CEQA guidelines for addressing GHG emissions. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the state CEQA Guidelines for greenhouse gas emissions, as required by Senate Bill 97. These proposed CEQA Guideline amendments would provide guidance to public agencies regarding the analysis and mitigation of the effects of greenhouse gas emissions in draft CEQA documents.

A key aspect of the proposed OPR guidance is that a lead agency shall have the discretion to determine, in the context of a particular project, whether to:

- Use a model of methodology to quantify GHG emissions, or
- Rely on a qualitative analysis or performance based standards

Furthermore, when assessing the significance of impacts from GHG emissions the lead agency may consider the following:

- The extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting;
- Whether project emissions exceeds a threshold of significance;
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for reduction or mitigation of GHG emissions.

4.2 The Challenge of Assessing Significance

The challenge in assessing the significance of individual project GHG emissions is to determine whether project specific GHG emissions, which are at a micro-scale relative to global emissions, would result in a cumulatively considerable incremental contribution to global climatic change, which is macro-scale impact. “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. Furthermore, the mere existence of significant cumulative impacts caused by other projects does not constitute substantial evidence that a proposed project’s incremental effects are cumulatively significant.



As presented in this staff report, the District has actively sought the input, advice, and assistance of numerous interested parties and stakeholder groups. Through the Climate Change Action Plan scoping meetings, the District explored numerous approaches for establishing significance thresholds for project specific GHG emissions. Furthermore, the District has closely monitored actions taken by ARB and OPR to comply with their legislative mandates and the District continues to actively participate in CAPCOA’s GHG Threshold and Mitigation subcommittee. The following discusses the various options considered by the District in establishing its proposed guidance for determining the significance of project specific GHG emissions.

Zero Threshold

The District has given due consideration to the complexity of evaluating the significance of project specific GHG emissions and. Some members of the District’s Climate Change Action Plan committee recommended that if project specific impacts can not be quantified, then to be most protective of the environment, the District should apply a zero threshold of significance. In applying a zero threshold of significance, all projects subject to CEQA, with new GHG emissions would have to be found to have a significant impact on global climatic change. Such a determination would require all feasible mitigation, with the goal of mitigating to a net zero emissions level.

Although a zero threshold is appealing in its simplicity; execution of a zero threshold would be difficult or impossible. Projects that could not be mitigated to zero would require preparation of an EIR and in approving such projects, lead agencies would be

required to adopt a statement of overriding consideration. This would result in an enormous regulatory burden on new projects and lead agencies across the District, with potentially very little positive gain in terms of GHG emissions mitigation. Furthermore, cost increases associated with compliance would likely result in projects being relocated to areas not subject to similar emission reduction requirements. Such “leakage” would not result in reduced GHG emissions and would serve to create a competitive disadvantage for businesses located within the District. ARB has concluded that zero thresholds are not mandated because some level of emissions in the near term and at mid-century is still consistent with climate stabilization and current and anticipated regulations and programs apart from CEQA will proliferate and increasingly will reduce GHG contributions⁷. ARB does not support a zero threshold, nor does the District.

Quantitative Thresholds

ARB, as well as other air districts within the state, has been considering quantitative thresholds. Several options exist for establishing quantitative thresholds, including mass of GHG emissions generated per unit of activity, GHG emissions per capita per unit basis, and percent reduction compared to business as usual. In evaluating this concept for stationary source projects (industrial and agricultural equipment and operations requiring air quality permits), the District used its database of permitted sources and its emissions inventory data to establish baseline GHG emissions data for key sources of GHG emissions. For development projects, the District used its Indirect Source Review database of development projects to baseline GHG emissions for both residential and non-residential development projects.

Using the data discussed above, the District explored a four tiered significance determination concept for use with both stationary source projects and development projects. Projects exempt from CEQA would be in tier one, and not be subject to further analysis, or GHG mitigation requirements. Tier two would contain projects considered too small to warrant further consideration (arbitrarily 10 percent of projects subject to CEQA). Such projects would not require quantification of GHG emissions, and would not require GHG mitigation. Tier three would contain projects with emissions greater than the minimum threshold, but below a maximum threshold. The maximum threshold would be set low enough to capture enough projects to offset the emissions not captured in tier two. Tier three projects would not require quantification of GHG emissions, would be required to reduce GHG emissions consistent with AB 32 targets, and would be considered less than significant. Tier four would contain projects above the maximum threshold. Tier four projects would require quantification of GHG emissions, and would be required to reduce their GHG emissions in excess to AB 32 emission reduction targets.

⁷ California Air Resources Board, Preliminary Draft Staff Proposal, Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases Under the California Environmental Quality Act. October 24, 2008.

Using existing databases, the District was able to establish baseline emissions for stationary source projects and development projects, and was able to establish mass GHG emissions per unit of activity. However, without supporting scientific information, establishment of tier trigger levels could be argued to be arbitrary. Furthermore, it is unclear that CEQA provides a legal basis for requiring proponents of large projects to mitigate their project impacts to the extent necessary to compensate for emissions not reduced by smaller projects.

Best Performance Standards

The existing science is inadequate to support quantification of the impacts that project specific GHG emissions have on global climatic change. No one has been able to scientifically demonstrate that a project of any size is significant, or insignificant. This is readily understood when one considers that global climatic change is the result of the sum total of GHG emissions, both man made and natural that occurred in the past; that is occurring now; and will occur in the future. Thus, there is growing scientific consensus that impacts of a specific project's emissions on global climatic change are cumulative in nature, and the significance thereof can only be examined in that context.

The State legislature, in enacting AB 32 and SB 375, and the Governor's Office of Planning and Research (OPR) in their CEQA guidelines for addressing GHG emissions (see page 46), provided the foundation for establishing performance based determinations of significance of GHG emissions. In enacting this landmark legislation the State considered the cumulative significance of GHG emissions and established aggressive GHG emission reduction targets for key sources of GHG emissions in the state of California. ARB in carrying out its AB 32 mandates has determined that the emission reductions targets established per AB 32 can be accomplished by achieving a 29% reduction in GHG emissions from business as usual (BAU), from key GHG emission source categories (see Figure 2). Thus establishing what could be considered a de facto standard for GHG emission reductions to be achieved at the project level for GHG emission source categories.

4.3 Determining Significance Using Best Performance Standards

4.3.1 Legislative Basis for use of Best Performance Standards

The basis for the use of performance based standards is well founded both legislatively and in implementation of legislative mandates. As presented before, SB 97 and SB 375 clearly provide for establishing either quantitative or qualitative based determinations of significance. ARB, in implementing their legislative mandate to develop guidance for assessing significance of project related GHG emissions, prepared a preliminary draft proposal that defines threshold of significance as “an identifiable quantitative, qualitative or performance level that marks the division between an impact that is significant and one that is not“. In April 2009, the Governor’s Office of Planning and Research (OPR) proposed several amendments to the CEQA Guidelines to address analysis and mitigation of potential effects of greenhouse gas emissions. Among the proposed amendments are provisions recognizing lead agency discretion to adopt quantitative or qualitative thresholds of significance. Specific amendments are presented below.



OPR proposed a new subdivision that emphasizes that the effects of greenhouse gas emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis. (See section 15130(f)). OPR further proposed a new subdivision to assist lead agencies in determining the significance of project related greenhouse gas emissions. (See section 15064.4.). In addition to quantification of GHG emissions, this section provides for the consideration of several other qualitative factors that may be used in the determination of significance. Per the proposed amendments, a lead agency has discretion to determine whether to:

- Use a model or methodology to quantify greenhouse gas emissions resulting from a project, or
- To rely on a qualitative analysis, or
- To apply performance based standards.

Under OPR's proposed guidance a lead agency may consider the following when assessing the significance of impacts from greenhouse gas emissions on the environment:

- The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting; or
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project, or
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

A new subdivision was added to assist lead agencies in determining methods to mitigate the effects of greenhouse gas emissions. (See section 15126.4(c)). To emphasize the advantages of programmatic planning this new subdivision emphasizes compliance with a plan among the list of potential mitigation measures. However, to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation. Finally, this subdivision reiterates that mitigation for planning level decisions may include the development of specific measures to be implemented on a project-by-project basis.

The District favors use of performance based standards, but recognizes that performance standards have not been developed for all sources of GHG emissions. Thus, for sources not covered by ARB's scoping plan or SB 375, the District will need to invest resources and work with stakeholders, ARB, planning agencies, and other interested parties to establish source specific performance standards. This process is expected to be ongoing, as mitigation measures and techniques will evolve and improve over time, as will our understanding of those measures.

4.3.2 Determining Significance

4.3.2.1 Introduction

CEQA requires lead agencies to establish specific procedures for administering its responsibilities under CEQA, including orderly evaluation of projects and preparation of environmental documents. Each lead agency is encouraged to develop and publish thresholds of significance for use in determining the significance of environmental effects.

Determining the significance of project specific impacts of GHG emissions on global climate change is a relatively new concept, and, in the absence of uniform guidance from the state, lead agencies throughout California are facing difficulties to develop their own policies

and procedures for implementing GHG CEQA requirements. The District is viewed by many in the San Joaquin Valley as the leading authority on air pollution concerns, including GHG issues, and so several lead agencies have asked the District to provide such guidance. Therefore, the District is developing guidance for its own internal use when serving as the lead agency, and is also proposing guidance to assist other agencies in establishing their own processes for determining significance of project related impacts on global climate change. The methodology being proposed relies on the use of performance based standards to assess the significance of project specific GHG emissions, and would be applicable to projects that result in increased GHG emissions. Nothing in this guidance shall be construed as limiting a lead agency's authority to adopt a statement of overriding consideration for projects with significant GHG impact.

The effects of project specific GHG emissions are cumulative, and without mitigation their incremental contribution to global climatic change could be considered cumulatively significant. The District believes that this is best addressed by requiring all projects (not just those with GHG emissions above some arbitrary "significance threshold") to reduce their GHG emissions, whether through project design elements, or mitigation. Projects achieving performance based standards that have been demonstrated to be "Best Performance Standards" would be considered to have a less than cumulative significant impact on global climate change.

Use of BPS would streamline the significance determination process by pre-quantifying the emission reductions that would be achieved by a specific GHG emission reduction measure and pre-approving the use of such a measure to mitigate project-related GHG emissions. Establishing BPS would also streamline the CEQA review process by providing project proponents, lead agencies and the public with clear guidance on how to mitigate GHG emission impacts. Thus, project proponents would be able to incorporate project specific GHG reduction measures during the initial project design phase, which could reduce or mitigate project specific GHG impacts to less than significant levels.

As presented in Chapter 5, to support a determination of significance, the efficiency of GHG emission reduction measures would be quantified at the time Best Performance Standards are established for a specific project type or source category. As shown in Appendix L, implementing BPS for stationary sources is expected to achieve an overall 34.0% reduction in GHG emissions, exceeding the overall 29% GHG emission reduction targeted by ARB in the scoping plan.

4.3.2.2 Definitions

The following definitions are provided to assist the reader in understanding the vernacular associated with the proposed approach of determining significance of project specific impacts on global climate change.

Achieved-in-Practice

Achieved-in-Practice is – Any equipment, technology, practice or operation available in the United States that has been installed and operated or used at a commercial or stationary source site for a reasonable period of time sufficient to demonstrate that the equipment, technology, practice or operation is reliable when operated in a manner that is typical for the process. In determining whether equipment, technology, practice or operation is Achieved-in-Practice, the District will consider the extent to which grants, incentives or other financial subsidies influence the economic feasibility of its use.

Approved Alternate Technology

Approved Alternate Technology is – Any District approved, Non-Achieved-in-Practice GHG emissions reduction measure equal to or exceeding the GHG emission reduction percentage for a specific BPS

Baseline

For Stationary Source projects, Baseline is – the three year average (2002-2004) of GHG emissions for a type of equipment or operation within an identified class and category, expressed as annual GHG emissions per unit.

For Residential Development projects, Baseline is – the three year average of GHG emissions from all dwelling units in the San Joaquin Valley Air District, during the 2002 through 2004 baseline period, expressed as annual GHG emissions per unit.

For Commercial and Industrial Development projects, Baseline is – the three year average of GHG emissions from all commercial or industrial units in the San Joaquin Valley Air District, during the 2002 through 2004 baseline period, expressed as annual GHG emissions per commercial or industrial unit.

Best Performance Standard

For Stationary Source Projects for which the District must issue permits, Best Performance Standard is – For a specific Class and Category, the most effective, District approved, Achieved-In-Practice means of

reducing or limiting GHG emissions from a GHG emissions source, that is also economically feasible per the definition of achieved-in-practice. BPS includes equipment type, equipment design, and operational and maintenance practices for the identified service, operation, or emissions unit class and category.

For Development Projects (Residential, Commercial or Industrial), Best Performance Standard is – Any combination of District approved, Achieved-In-Practice emission reduction measures reducing or limiting GHG emissions by in at least a 29% compared to BAU. GHG emission reduction measures include building standards, appliance standards, project design elements, and land use decisions.

Business-as-Usual

For Stationary Source Projects, Business-as-Usual is - the emissions for a type of equipment or operation within an identified class and category projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period.

For Development Projects (Residential, Commercial or Industrial), Business-as-Usual is – total baseline emissions for all emissions sources within the development type, projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period.

Category

For stationary source permitting projects, Category is – A District approved subdivision within a “class” as identified by unique operational or technical aspects.

Class

For stationary source permitting projects, Class is - The broadest District approved division of stationary GHG sources based on fundamental type of equipment or industrial classification of the source operation.

4.3.2.3 Establishing Business-as-Usual and Baseline

In executing its legislative mandate to establish emission reduction targets which would achieve the 1990 GHG emission levels by the year 2020, the California Air Resources Board (CARB) used its emission inventory to establish a three-year average for GHG emissions occurring by sector during the baseline period of 2002-2004. As presented in Figure 4, Baseline Period GHG emissions exceed 1990 emission levels

by almost 10 percent. Baseline Period GHG emissions include emissions from all sources in ARB's emissions inventory, including both, old and new, large and small GHG emission sources.

The Baseline Period emissions were then projected to the year 2020, using assumptions about potential growth, assuming no change in the existing business practices, and without considering implementation of any GHG emission reduction measures. CARB designated the baseline emissions inventory projected to the year 2020 as business-as-usual (BAU). As presented in Figure 5, CARB determined that a 29% GHG emissions reduction from BAU is necessary to achieve the 1990 GHG emissions level.

BAU, as established by CARB, is a projected emissions inventory and does not represent actual business or operational practices generating GHG emissions. Therefore, to relate BAU to an emissions generating activity, the District proposes to establish emission factors per unit of activity, for each class and category, using the 2002-2004 baseline period as the reference. For example, for a combustion process, an emissions factor could be expressed as pounds of GHG emissions generated per cubic feet of gas consumed, or pounds of GHG emissions generated per unit of production. For a residential development project an emissions factor could be expressed as annual pounds of GHG emissions generated per dwelling unit.

Thus, by comparing emissions per unit of activity, one can determine the extent to which GHG emissions from a specific source have changed compared to BAU. GHG emission reductions would be determined by establishing a GHG emissions factor per unit of activity for the proposed project and comparing it to the emissions factor established for the 2002-2004 baseline period. Projects implementing BPS, or otherwise demonstrating that GHG emissions have been reduced by 29% will be determined to have a less than significant individual and cumulative impact on global climate change. The percent reduction in GHG emissions would be calculated using the following methodology:

$$\% \text{ Reduction in GHG Emissions} = \frac{(2002 - 2004 \text{ baseline GHG Emission factor}) - (\text{Proposed project GHG Emissions factor})}{2002 - 2004 \text{ baseline GHG Emission factor}} \times 100\%$$

Figure 4: 2002-2004 Baseline Period

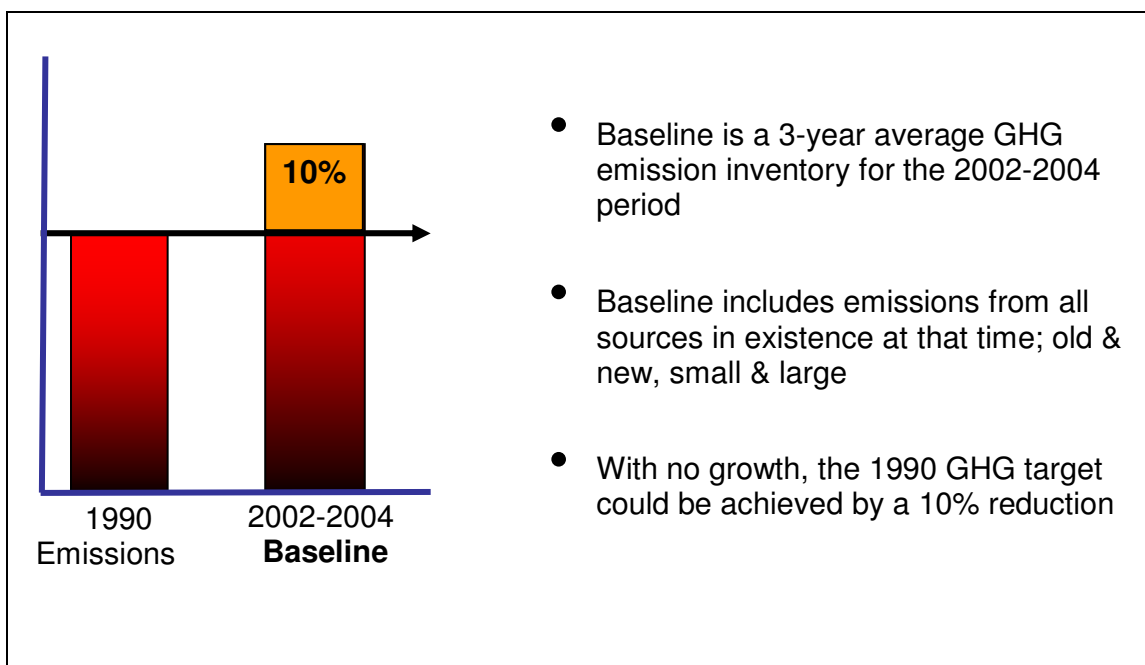
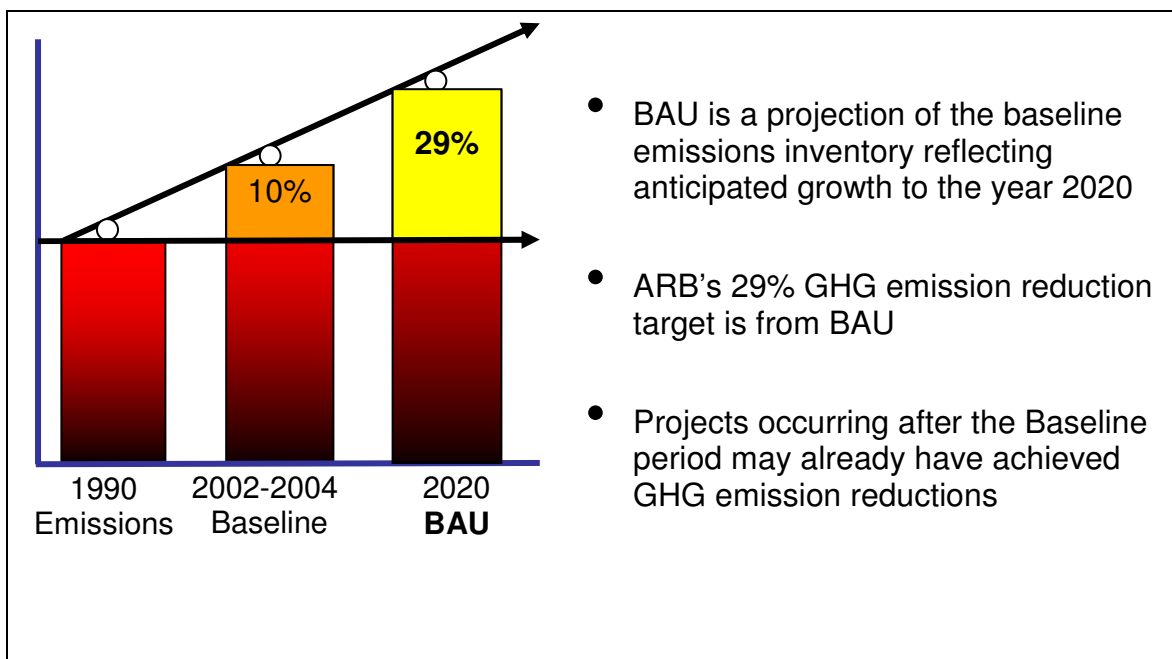


Figure 5: 2020 Business-as-Usual (BAU)



4.3.2.4 Determining Project Significance

The District will establish Best Performance Standards (BPS) for stationary sources permitted by the District and will propose GHG emission reduction measures to achieve BPS for development projects. BPS is intended to achieve the maximum GHG emission reductions from a stationary source project and achieve a cumulative total of at least 29% reduction in GHG emissions from development projects, compared to BAU.

In evaluating GHG emissions from a specific project the District recommends that a lead agency characterize both direct and indirect GHG emissions. Direct GHG emissions would include emissions resulting from a specific operation or process, e.g. fuel combustion emissions from a boiler. Indirect GHG emissions would include emissions resulting from project related energy consumption, e.g. electricity consumed by the production and electricity required to produce and transport water used by the project. For projects resulting in increased vehicle miles traveled (VMT), indirect GHG emissions associated with transportation related activities would also be included in the GHG emissions quantification.

Projects exempt from the requirements of CEQA would not require further analysis, including analysis of project specific GHG emissions. Projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency.

Projects requiring project specific environmental review would be evaluated according to a Best Performance Standards (BPS) approach. Projects complying with the GHG emission reduction requirements established as Best Performance Standards would not require project specific quantification of GHG emissions and would be determined to have a less than significant individual and cumulative impact for GHG emissions.

Projects not complying with GHG emission reduction requirements established as Best Performance Standards would require quantification of project specific GHG emissions. To be determined to have a less than

significant individual and cumulative impact on global climate change, project specific GHG emissions have to be reduced or mitigated by 29% from Business-as-Usual GHG emissions.

Projects requiring preparation of an Environmental Impact Report would require quantification of project specific GHG emissions. Projects implementing BPS or achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.

4.3.2.5 Determining Significance for Stationary Source Projects

Introduction

CEQA requires lead agencies to establish specific procedures for administering its responsibilities under CEQA, including orderly evaluation of projects and preparation of environmental documents. Each lead agency is encouraged to develop and publish thresholds of significance for use in determining the significance of environmental effects. The San Joaquin Valley Air Pollution Control District proposes the following process for determining the individual and cumulative significance of project specific GHG emissions on global climate change when issuing permits for stationary source projects: However, nothing in this guidance shall be construed as limiting a lead agency's authority to adopt a statement of overriding consideration for projects with significant GHG impact.

District Process for Evaluating GHG Significance

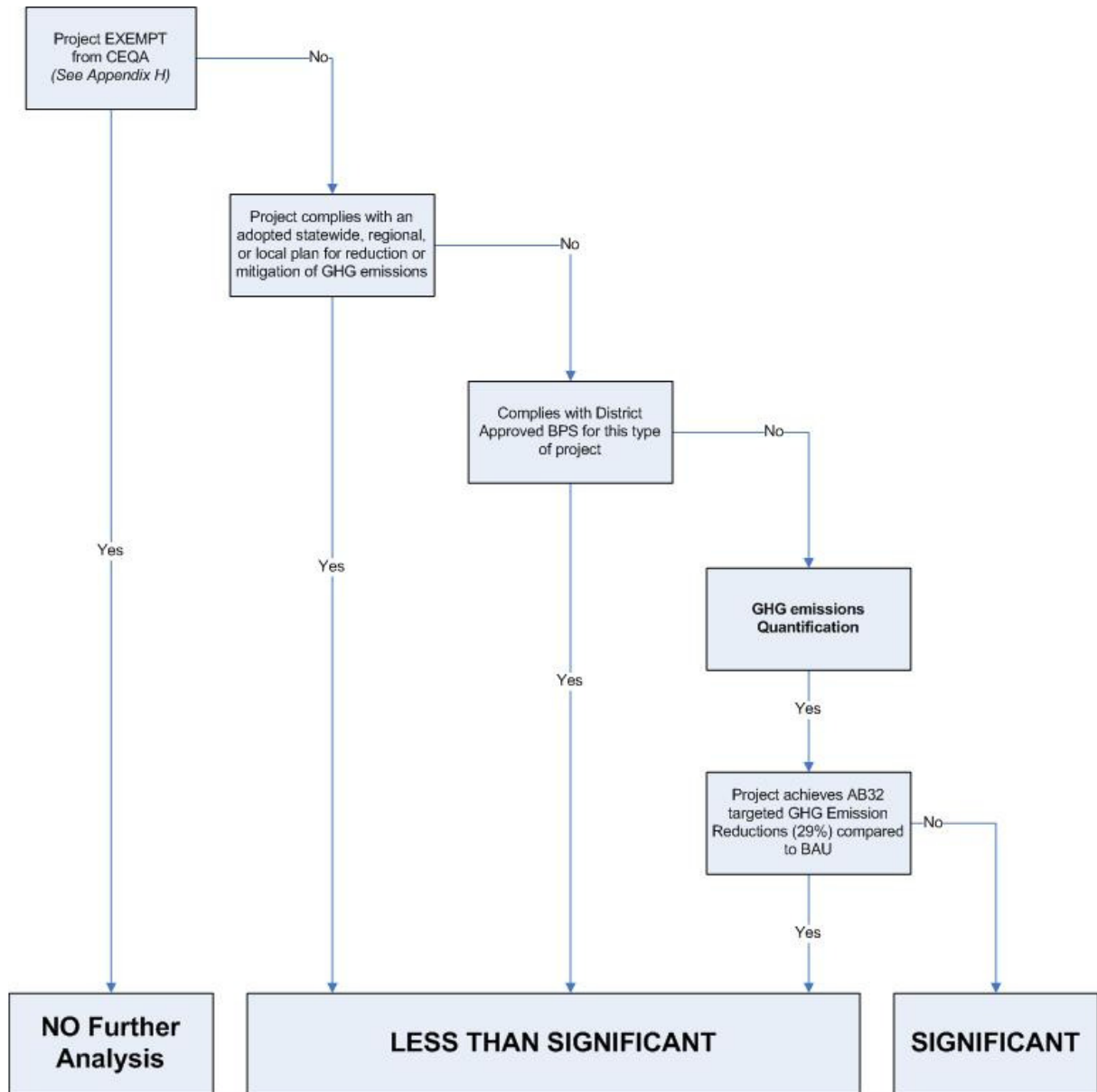
- Projects determined to be exempt from the requirements of CEQA would be determined to have a less than significant individual and cumulative impact for GHG emissions and would not require further environmental review, including analysis of project specific GHG emissions. Projects exempt under CEQA would be evaluated consistent with established rules and regulations governing project approval and would not be required to implement BPS.
- Projects complying with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency

with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement BPS.

- Projects implementing Best Performance Standards would not require quantification of project specific GHG emissions. Consistent with CEQA Guideline, such projects would be determined to have a less than significant individual and cumulative impact for GHG emissions.
- Projects not implementing Best Performance Standards would require quantification of project specific GHG emissions and demonstration that project specific GHG emissions would be reduced or mitigated by at least 29%, compared to BAU, including GHG emission reductions achieved since the 2002-2004 baseline period. Projects achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.
- Projects requiring preparation of an Environmental Impact Report would require quantification of project specific GHG emissions. Projects implementing BPS or achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.

Figure 6 illustrates implementation of this guidance for permitted sources.

Figure 6: Stationary Source Projects with GHG Emissions



4.3.2.6 Determining Significance for Development Projects

Introduction

Determining the significance of project specific impacts of GHG emissions on global climate change is relatively new and lead agencies are finding themselves challenged to develop their own guidance. Many land use agencies have expressed serious concerns about the lack of guidance, and some have asked the District for their assistance in finding an adequate approach to address these new CEQA requirements. Therefore, the District is proposing the following guidance to assist lead agencies in establishing their own processes for determining significance of project related impacts on global climate change. Nothing in this guidance shall be construed as limiting a lead agency's authority to adopt a statement of overriding consideration for projects with significant GHG impact.

Proposed Land Use Agency Process for Evaluating GHG Significance

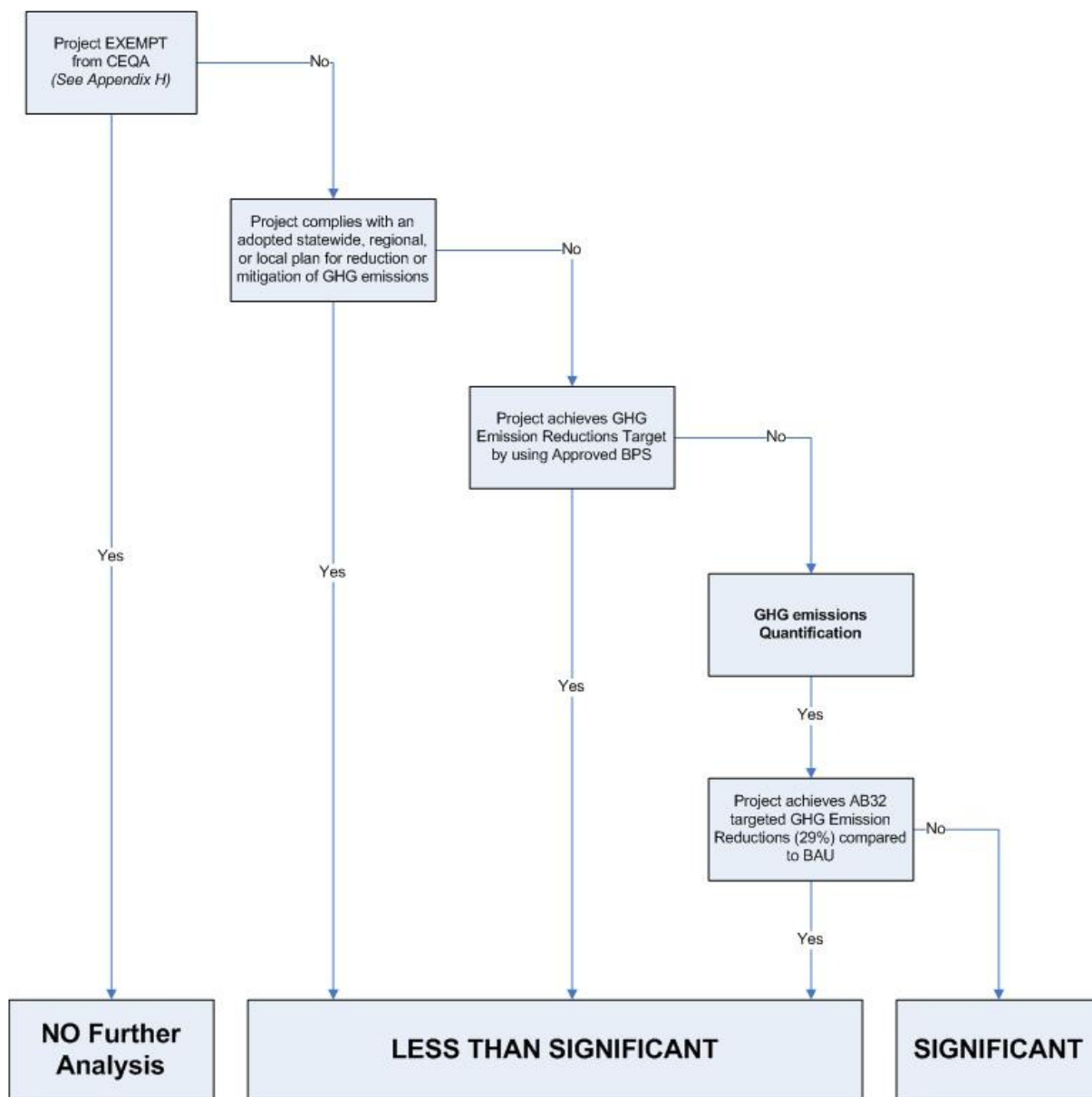
- Projects determined to be exempt from the requirements of CEQA would be determined to have a less than significant individual and cumulative impact for GHG emissions and would not require further environmental review, including analysis of project specific GHG emissions. Projects exempt under CEQA would be evaluated consistent with lead agency rules and regulations governing project approval and would not be required to implement BPS.
- Projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement BPS.
- Projects implementing BPS, reducing project specific GHG emissions by at least 29% compared to BAU, would be determined to have a less than significant individual and cumulative impact on

global climate change. Reductions in project specific GHG emissions would include GHG emission reductions achieved since the 2002-2004 baseline period. Projects determined to have a less than significant individual and cumulative impact for GHG emissions would not require quantification of project specific GHG emissions.

- Projects not implementing BPS, to achieve at least a 29% reduction in GHG emissions as compared to BAU, would require quantification of project specific GHG emissions. Projects demonstrated to have reduced or mitigated project specific GHG emissions by at least 29% compared to BAU would be determined to have a less than significant individual and cumulative impact on global climate change.
- Projects requiring preparation of an Environmental Impact Report would require quantification of project specific GHG emissions. Projects implementing BPS or achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.

Figure 7 illustrates implementation for development projects.

Figure 7: Development Projects with GHG Emissions



CHAPTER 5

DISTRICT BEST PERFORMANCE STANDARDS

5.1 Best Performance Standards - Principles

The District will establish Best Performance Standards (BPS) for stationary sources permitted by the District and will propose GHG emission reduction measures to achieve BPS for development projects for use by land use agencies in the San Joaquin Valley. BPS is intended to achieve feasible GHG emission reductions from the stationary source project and achieve a combined total of 29% reduction in GHG emissions from development projects.



Use of BPS would streamline the significance determination process by pre-quantifying the emission reductions that would be achieved by a specific GHG emission reduction measure and pre-approving the use of such a measure to mitigate project-related GHG emissions. Establishing BPS would also streamline the CEQA review process by providing project proponents, lead agencies and the public with clear guidance on how to mitigate GHG emission impacts. Thus, project proponents would be able to incorporate project specific GHG reduction measures during the initial planning phase, which could reduce or mitigate project specific GHG impacts to less than significant levels.

BPS would be established through a process approved by the District's Governing Board. As defined, BPS is the most effective, achieved-in-practice, means of reducing or limiting GHG emissions from a GHG emissions source. For traditional stationary

source projects, BPS includes equipment type, equipment design, and operational and maintenance practices for the identified service, operation, or emissions unit class and category. For development projects, BPS includes project design elements, land use decisions, and technologies that reduce GHG emissions.

Establishing BPS would help project proponents, lead agencies, and the public by proactively identifying effective, feasible mitigation measures. Emission reductions achieved through implementation of BPS would be pre-quantified thus, negating the need for project specific quantification of GHG emissions. The use of BPS provides opportunity to streamline the process of determining the individual and cumulative significance of project specific GHG impacts on global climate change, conserving resources and reducing regulatory burdens.

5.2 Establishing Best Performance Standards

5.2.1 Introduction

Through implementing stationary source permitting processes and District Rule 9510 (Indirect Source Review), District staff has considerable experience in evaluating emissions control technologies and evaluating project specific emissions from stationary sources and development projects. The proposed process for establishing BPS builds upon this experience. In developing BPS District staff will solicit input from industry, manufacturers, academia, environmentalists, environmental justice groups, regulatory agencies, and other members of the public, as well as utilize the technical expertise and experience of the District's staff.

In establishing BPS for a specific equipment or operation the District's initial focus will be to establish BPS for equipment and operations that are commonly permitted or representing larger sources of GHG emissions. It is anticipated that initial Classes and Categories will be general in nature, covering a broad range of GHG emission sources. These broad categories will be refined and narrowed in scope as projects pass through the BPS development process and through associated permitting processes.

5.2.2 Public Process

BPS will be established through a public process that provides ample opportunity for stakeholders and other interested parties to participate and provide valuable input into the establishment of baseline GHG emissions and BPS.

The public process will begin with an initial outreach via the District's CCAP list server. Individuals registered with the CCAP list server will be notified when the District initiates the process of establishing BPS for a specific equipment or operation within an identified Class and Category. Individuals interested in participating in the public process would register themselves with a list server dedicated to the BPS under development. Using the dedicated BPS list server, stakeholders and other interested parties will have opportunity to provide the District with information to be considered when drafting documents establishing baseline GHG emissions and BPS. When draft documents are available on the District's website for review and comment, a notice of availability will be sent via the BPS list server. Workgroups would be convened as necessary to obtain additional technical information for use in establishing baseline emissions or BPS. After receiving public input, the BPS will be finalized and posted on the District's website. Availability of final BPS will be noticed via the District's general CCAP list server.

5.2.3 Process for Establishing BPS - Stationary Source Projects

5.2.3.1 Introduction

To be approved by the District, BPS must be demonstrated to achieve real GHG emission reductions. Such reductions must be quantifiable to support a determination that project specific GHG emissions would have a less than significant individual and cumulative impact.

In evaluating GHG emissions from a specific project the District will characterize both direct and indirect emissions. Direct GHG emissions would include emissions resulting from the specific operation or process, e.g. exhaust emissions from a boiler. Indirect GHG emissions would include GHG emissions resulting from project related energy consumption, and electricity consumed by the production and transport of water used by the project. For projects resulting in increased vehicle miles traveled (VMT), indirect GHG emissions associated with transportation related activities would also be included in the GHG emissions quantification.

To ensure that the criteria discussed above are satisfied, the District proposes the following process to establish BPS:

5.2.3.2 Process for Establishing BPS for Stationary Source Projects

1. Establish Baseline GHG emissions factor per unit of activity for the proposed equipment or operation identified within a specific class and category
2. For the specific equipment or operation being proposed within a specific class and category, list all technologically feasible GHG emissions reduction measures, including equipment selection, design elements and best management practices, that do not result in an increase in criteria pollutant emissions compared to the proposed equipment or operation
3. For all technologically feasible GHG emission reduction measures identified in steps 2, identify all GHG reduction measures determined to be Achieved-in-Practice. In determining Achieved-in-Practice, consider the extent to which grants or other financial subsidies influence economic feasibility.
4. For each Achieved-in-Practice GHG emission reduction measure identified in steps 3:
 - a. Quantify the potential GHG emission reduction, as compared to the Baseline GHG emissions factor per unit of activity
 - b. Express the potential GHG emission reduction as a percent of Baseline GHG emissions factor per unit of activity
5. Rank all Achieved-in-Practice GHG emission reduction measures by order of percent GHG emissions reduction,
6. Deem the Achieved-in-Practice GHG emissions reduction measure(s) with the highest percent reduction in GHG emissions as the District approved Best Performance Standard (BPS) for the respective class and category of equipment or operation being proposed, and
7. Eliminate all other Achieved-In-Practice options from consideration as BPS

5.2.4 Process for Establishing BPS - Development Projects

5.2.4.1 Introduction

GHG emission from development projects primarily occur indirectly through energy consumption and vehicle miles traveled (VMT). Developers can reduce GHG emissions from energy consumption through building designs that increase energy efficiency, water conservation, and the use of energy efficient appliances. Developers can further reduce GHG emissions through project designs that reduce VMT through features that promote pedestrian access and use of public transportation. Land use planning decisions, such as creating mixed-use development, discouraging leap-frog development, and creating favorable jobs to housing ratios can significantly reduce VMT and the associated GHG emissions. For the purpose of this guidance a development project is any project, or portion thereof, that is subject to a discretionary approval by a public agency, and will ultimately result in the construction of a new building, facility, or structure, or reconstruction of a building, facility, or structure.

It should be noted that ARB considered only GHG emissions from energy consumption when establishing baseline and BAU emissions for development projects. ARB addresses VMT emission reduction strategies as part of transportation related impacts. However, District staff considers reducing VMT emissions attributable to development projects to be an integral component of the District's attainment strategy, and inclusion of proposed BPS to be a logical extension of that effort.

Given the diversity of development projects occurring in the Valley, it is not feasible to develop a single set of standards that would be applicable to all development projects. Instead, the District will establish a list of GHG emission reductions measures with pre-quantified GHG emission reduction effectiveness. Projects implementing BPS and reducing GHG emissions by 29% through any combination of GHG emission reduction measures, including GHG emission reductions achieved as a result of changes in building and appliance standards occurring since the 2002-2004 baseline period, would be considered to have a less than significant individual and cumulative impact on global climate change.

5.2.4.2 Process for Establishing BPS for Development Projects

To be approved by the District, GHG emissions reduction measures used to meet BPS must be demonstrated to achieve real GHG emission reductions. Such reductions must be quantifiable to support a determination that project specific GHG emissions would have a less than significant individual and cumulative impact. To ensure that these criteria are satisfied, the District proposes the following process to establish BPS.

1. Establish Baseline GHG emissions factor per unit of activity for residential, commercial and industrial development projects
2. For the specific development type (Residential, Commercial or Industrial), list all achieved-in-practice GHG emissions reduction measures, including building design elements, building and appliance standards, project design elements; and land use decisions
3. For each achieved-in-practice GHG emission reduction measure identified in step 2:
 - a. Quantify the potential GHG emission reduction, as compared to the Baseline GHG emissions factor per unit of activity, and
 - b. Express the potential GHG emission reduction as a percent of the Baseline GHG emissions factor per unit of activity
4. Any combination of approved GHG emissions reduction measures achieving a combined 29% of GHG emissions compared to the established Baseline GHG emissions factor per unit of activity is considered **Best Performance Standard** (BPS) for the respective type of development project.

5.3 Process for Reviewing Established Best Performance Standards

Implementation of strategies to achieve AB 32 emission reduction targets is anticipated to drive technology development, potentially obsolescing or improving established standards over time. Therefore, the District is proposing a process that will result in periodic review of adopted Best Performance Standards and emerging technologies. To ensure that Best Performance Standards reflect the most current available technology, the District will conduct annual reviews and revise established Best Performance Standards, if necessary, to include new and improved technologies. Revisions to BPS will only be applicable to future projects and would not be applied retroactively to projects already permitted or approved.

Project-by-Project Basis

Project proponents or other members of the public may propose other technologies, equipment designs, or operational/maintenance practices. When proposed by a project proponent in lieu of an adopted Best Performance Standard, the District will evaluate the proposed GHG emission reduction measure. If demonstrated to be equivalent to or better than District approved BPS, the proposed GHG emission reduction measure will be added to the list of approved BPS. If demonstrated to be superior to District approved BPS and achieved-in-practice, the proposed GHG emission reduction measure will replace the existing District approved BPS for future projects.

Annual Evaluation

The District will evaluate BPS on an annual basis. District approved BPS will be compared to newly identified GHG emission reduction measures, if available. If demonstrated to be equivalent to District approved BPS, new GHG emission reduction measures will be added to the list of approved BPS. If demonstrated to be superior to District approved BPS and achieved-in-practice, new GHG emission reduction measures will replace existing District approved BPS for future projects.

5.4 Best Performance Standards

During the public participation process for developing this guidance, the District received comments that the discussion of BPS should be supported by specific examples of BPS for major sources of GHG emissions. In response, the District has prepared the following illustrative examples of potential BPS. It should be noted that these examples of BPS are for illustrative purposes only, and should not be used by any lead agency as District-approved or sanctioned standards. As discussed further in this staff report, the proposed process of establishing BPS provides opportunity for public input into the development of BPS, and final BPS can only be established after such a process.

5.4.1 Best Performance Standards for Stationary Source Projects

Introduction



The District's existing CEQA Implementation District Procedure establishes a methodology to consistently evaluate potential environmental impacts from stationary source projects. This internal procedure document will be amended to incorporate requirements associated with the GHG emissions significance determinations. A particular effort will be

made to streamline the process of GHG emissions impact evaluation, consistent with the best performance standard-based determination of significance discussed in this staff report.

5.4.2 Illustrative Examples of Best Performance Standards for Stationary Source Projects

The following discussion illustrates possible BPS, as presented in Appendix I, for stationary source projects and provides the bases and/or rationale for each, as well as an assessment of potential GHG emissions reduction impact relative to a 2002-2004 emissions inventory baseline.



It should be noted that these examples of BPS are for illustrative purposes only, and should not be used by any lead agency as District-approved or sanctioned standards. As discussed further in this staff report, the proposed process of establishing BPS provides opportunity for public input into the development of BPS, and final BPS can only be established after such a process.

1. Fossil Fuel-fired Boilers, Steam Generators and Process Heaters with Firing Capacity > 5 MMBtu/hour (HHV)

Illustrative BPS:

All units shall utilize gaseous fuel only and be appropriately sized and/or have adequate load following capability to avoid the venting of steam to the atmosphere except during emergency situations or during specifically identified and limited maintenance or startup/shutdown operations essential to the unit operation. In addition, each unit shall meet at least one of the two following criteria:



- (1) The unit shall be designed for a minimum thermal efficiency of 95 % and shall utilize a variable frequency drive electric motor on combustion air/FGR fans or,*
- (2) The unit shall be designed for maximum thermal efficiency by incorporating all of the following design features: a) install adequate heat transfer surface to provide a maximum design approach of 20 °F between the stack gas temperature and the process inlet temperature, b) limit the use of flue gas recirculation (FGR) for NO_x control to no more than 10 % , c) minimize excess air in combustion by*

maintaining a maximum O₂ concentration of 3 volume percent in the stack gas and d) use a variable frequency drive electric motor on combustion air/FGR fans

BPS Determination

The proposed BPS for this category represents the best Achieved-in-Practice technology identified, and consists of a collection of current state-of the-art, achieved-in-practice design and operational practices for achieving maximum practical thermal efficiency and limiting GHG production. These consist of the following three elements:

1. Use of gaseous fuel which has a lower carbon content per Btu than liquid or solid fuels and thus provides lowest GHG emissions per Btu fired.
2. Appropriate boiler sizing with load following capability to minimize potential steam venting (and the associated excess GHG emissions). This requirement results in a boiler installation having sufficient turndown capability and operating flexibility to match the thermal demand without venting any steam. This may require installation of multiple smaller units rather than a single large unit and may require specific design features in the burner and controls to provide adequate load-following capability.
3. Maximum practical thermal efficiency achieved by either of the two following options:

BPS Option 1:

A fully condensing boiler with a minimum efficiency of 95%. For units without air preheaters, this efficiency level can only be achieved in cases where the process side inlet temperature is below 100 °F. Typically a boiler with 100% cold makeup would lie in this category (a tomato processing facility typically operates in this fashion).

and,

Utilize a variable speed electric motor on all flue gas fans to provide energy savings whenever the unit is not operating at maximum capacity.

BPS Option 2:

Maximize the thermal efficiency by implementing a heat recovery design based on a maximum approach of 20 °F between the stack gas temperature and the process inlet temperature. This represents a maximum practical achieved-in-practice heat recovery

and,

Limit FGR to 10 % to save power on fan operation, allow lower excess air levels in the stack and improve turndown and load following response for the unit. This specification may, in effect, require use of Selective Catalytic Reduction (SCR) for NO_x emissions control in some applications. Operation with a high FGR rate requires a significantly increased horsepower for the combustion air fan operation due both to increased volumetric flow and to increased pressure drop in the unit. Additionally, operation with high FGR rates for NO_x control reduces burner stability and response and results in stack O₂ concentrations as high as 4-5% versus a more efficient 3% O₂ achievable with limited FGR rates

and,

Limit the concentration of O₂ in the stack gas to 3%. This value for O₂ concentration allows minimizing energy loss to the stack while still maintaining adequate safety margin in the operation. As mentioned above, limiting FGR rate to 10% makes this low concentration operation feasible

and,

Utilize a variable frequency drive (VFD) electric motor on all flue gas fans to provide energy savings whenever the unit is not operating at maximum capacity.

To assess the potential impact of the proposed BPS, specific equipment configurations have been established which are assumed to represent the typical (average) equipment in this category in existence at the time of the 2002-2004 emissions inventory:

Boiler: 150 psig steam boiler not equipped with an economizer, producing saturated steam at 150 psig (367 °F), feed water at 200 °F, stack temperature 407 °F (40 °F approach) and stack O₂ concentration of 4.5 %. Fan driver is a standard efficiency (85%) electric motor. Flue gas recirculation for NO_x control is 40% of total flue gas.

Steam Generator: 1250 psig steam generator producing 1250 psig steam at 65 % quality, feed water at 140 °F, operating at 80% of maximum rate. Stack temperature is 280 °F (140 °F approach) with 4.5 % O₂. Fan driver is a standard efficiency (85%) electric motor. Flue gas recirculation for NO_x control is 40% of total flue gas.

Process Heater: Refinery heater with 350 °F process inlet temperature, operating at 80 % of maximum rate with a stack temperature of 430 °F (80 °F approach)

and stack O₂ concentration of 4.5%. Fan driver is a standard efficiency (85%) electric motor. Flue gas recirculation for NO_x control is 20% of total flue gas.

The following table compares the expected thermal efficiencies and GHG emissions from each equipment category during the baseline years with that which would be attained from implementation of BPS:

Summary of BPS and achieved GHG emission reductions:

BPS for: Boilers, Steam Generators and Process Heaters					
Equipment Category	Baseline		Best Performance Standard		GHG Emission Reduction (%)
	Thermal Efficiency (%)	GHG Emissions (lb-CO ₂ /MMBtu)	Thermal Efficiency	GHG Emissions (lb-CO ₂ /MMBtu)	
Boiler	80.6	148	85.9	137	7.4%
Steam Generator	84.0	142	87.4	135	4.9%
Process Heater	80.0	148	82.3	143	3.4%

The emission calculations for BPS in the preceding table assume that a Selective Catalytic Reduction (SCR) system has been installed for NO_x emission control and include the emissions associated with the production of ammonia required for the SCR operation. The calculations also include the impact of reduced electric power requirement for fans associated with BPS.

Compliance Assurance

The BPS for this category shall be enforced through design standards, equipment description, and permit conditions.

The following permit conditions will apply:

- In order to minimize Green House Gas emissions and optimize equipment efficiency, all equipment shall be operated in accordance with manufacturer specifications and approved design specifications. [California Environmental Quality Act]*

- *The flue gas recirculation (FGR) rate shall not exceed 10%. [California Environmental Quality Act]*
- *Oxygen concentration in the flue gas shall not exceed 3 percent by volume. [California Environmental Quality Act]*

Alternate Approved Technology

Other approved technologically feasible GHG emission reduction measures which are not achieved-in-practice, but offer GHG emissions reductions equal to or greater than the identified BPS are:

- Install equipment utilizing a solar energy source in lieu of fossil fuel.
- Obtain equivalent GHG emission performance by recovery and permanent sequestration of CO₂ from the exhaust of the unit.
- Fire unit with biogenic fuel derived from renewable natural or waste sources (fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria)

2. Non-Emergency Flares With Rated Heat Release > 5 MMBtu/hour (HHV)

Illustrative BPS:

Combustion shall be performed in an alternate device in lieu of a flare which produces useful energy which would have otherwise been required (utilized as fuel in an engine, boiler, turbine or delivered to a natural gas pipeline, etc.) where the proposed operation is non-emergency. Emergency flares shall utilize a flow-sensing ignition device rather than a continuous pilot and non-GHG purge gas.



BPS Determination

The proposed BPS for this category represents the most stringent Achieved-in-Practice technology currently recognized consisting of a requirement to utilize the heating value of the material to be combusted in a device (other than a flare) which produces useful energy rather than simply exhausting the energy to the atmosphere as does a flare. Production of useful energy implies that GHG emission reductions are achieved by offsetting other energy consumption which

would have been required in any event. For emergency-only flares, which are not considered to be a major source and may be a requirement for protection of public health and safety, the use of a flare may be allowed but the flare is required to operate with a flow sensing ignition system and use only non-GHG gas for purge gas to minimize GHG emissions.

To demonstrate the impact of the proposed BPS, the equipment being operated during the 2002-2004 emission inventory baseline is assumed to be a flare rated at 50 MMBtu/hr, operating at an average utilization of 50% combusting a hydrocarbon stream and utilizing a continuous natural gas-fired pilot consuming 3 scfm of natural gas for pilot and purge operations. Such a flare has estimated GHG emissions of 12,900 tons CO₂E per year. Combusting the fuel in a typical natural gas-fired engine/generator operating with a heat rate of 12,160 Btu per kWh (HHV) produces 18,140 megawatt-hours of electric power per year. This offsets approximately 7,970 tons per year of GHG emissions from utility power plants based on a California electric utility emission rate of 879 lb-CO₂/MWh (EPA eGrid data for 2004). Net GHG emissions are then determined to be 12,900 – 7,970 = 4,930 tons per year or a reduction of 62 percent.

For an emergency-only flare, the requirement to use a flow sensing ignition system would eliminate the fuel consumption by the continuous pilot and eliminate 100% of all routine GHG emissions.

Summary of BPS and achieved GHG emission reductions:

BPS for: Non-Emergency Flares			
Baseline	BPS	GHG	GHG Emission Reduction (%)
Flare With Continuous Pilot	Utilize Alternate Device Producing Useful Energy (Gas-Fired Engine/Generator)	CO ₂	62%

Compliance Assurance

The BPS for this category shall be enforced through design standards, equipment description, and permit conditions.

The following permit conditions will apply:

- *In order to minimize Green House Gas emissions and optimize equipment efficiency, all equipment shall be operated in accordance with manufacturer specifications and approved design specifications. [California Environmental Quality Act]*

Approved Alternate Technology

An approved technologically feasible GHG emission reduction measure which is not achieved-in-practice, but offers GHG emissions reductions equal to or greater than the identified BPS is:

- Obtain GHG emission performance equivalent to BPS by recovery and permanent sequestration of CO₂ from the exhaust of the unit.

3. Non-Emergency Onsite Electric Power Generation with Fossil Fuel Combustion > 5 MMBtu/hour or With Fossil Fuel-Fired Mechanical Driver > 50 bhp.

Illustrative BPS:

Electric power supply shall be provided solely by a PUC-licensed electric utility in lieu of a fossil fuel-fired unit except for facilities meeting any of the following criteria:

1. *Emergency standby power generation, or*
2. *Power generation from a cogeneration unit*

BPS Determination

The proposed BPS for this category represents the most stringent Achieved-in-Practice technology currently recognized consisting of a requirement to utilize electric power obtained from the public utility electric power grid rather than produce power for private use except for cases where standby emergency power is required. Generation of emergency standby power is not considered to be significant source and thus no specific BPS is required for this case. Cogeneration units



are covered by a separate BPS and are required by the BPS for that class of operation to generate electric power with an incremental GHG emissions rate which is lower than the emissions rate for electric utility generation in California. To assess the potential impact of the proposed BPS, the equipment operated during the 2002-2004 baseline emission inventory is assumed to be a natural gas-fired IC engine powering a generator and operating at a typical heat rate of 13,000 Btu/kWh (HHV). Expected GHG emissions are 1.52 lb-CO₂/kWh. Converting this operation to utility-supplied electric power per the BPS would yield an alternative emission factor of 0.879 lb-CO₂/ kWh (per EPA eGrid emission data for California (2004)). Net emission reduction from the base case would therefore be 1.52 – 0.879 = 0.64 lb-CO₂/ kWh or 42 %.

Summary of BPS and achieved GHG emission reductions:

BPS for: Non-Emergency Onsite Electric Power Generation			
Baseline	BPS	GHG	GHG Emission Reduction (%)
Natural Gas Engine/Generator	Utility-Supplied Power	CO ₂	42%

Compliance Assurance

Since compliance with the BPS is achieved by meeting the design standard (installation of an electric motor which does not require a District permit), no enforcement provisions are applicable or necessary.

Approved Alternate Technology

Three other approved technologically feasible GHG emission reduction measures which are not achieved-in-practice, but offer GHG emissions reductions equal to or greater than the identified BPS are:

- Utilize solar energy source in lieu of firing fossil fuels.
- Obtain GHG emission performance equivalent to BPS by recovery and permanent sequestration of CO₂ from the exhaust of the unit.
- Utilize biogenic fuel derived from renewable natural or waste sources in lieu of fossil fuel (biogenic fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria)

4. Non-Emergency Mechanical Equipment Driver (requirement in lieu of reciprocating IC engines > 50 hp and combustion turbines > 3 MMBtu/hour excluding combustion turbines in cogeneration service)

Illustrative BPS:

A non-emergency mechanical equipment driver shall consist of an electric motor, in lieu of a fossil fuel-fired unit, with energy efficiency meeting the efficiency criteria for Premium Efficiency Electric Motors as specified in the National Electrical Manufacturer's Association (NEMA) Standard MG-1 or, upon District approval of submitted documentation which corroborates a claim by the applicant that such electric motor is not feasible, applicant may install a motor with efficiency equal to the maximum available for the proposed class of motor.

BPS Determination

The proposed BPS for this category, applicable to both proposed stationary and transportable operations, represents the most stringent Achieved-in-Practice technology currently recognized consisting of a requirement to utilize a premium efficiency electric motor in lieu of a fossil fuel-fired device (IC engines, gas turbines, etc.) to power mechanical equipment such as pumps and compressors. This BPS achieves GHG emission reductions due to the average emission rate for power production at utility power plants being lower than that which can be achieved by a fossil fuel-fired equipment driver. The specification of premium efficiency for the electric motor per the stated NEMA standard may not be universally applicable for certain specialized motors which is recognized in the BPS by allowing a lower efficiency based on approved documentation attesting to the infeasibility of the premium efficiency standard.



An electric motor offers lower GHG emissions than any available fossil fuel-fired equipment driver. Assuming a premium 95 % efficient motor, energy use per brake horsepower is $0.7457 \text{ kWh/bhp-hr} \div 95\% = 0.785 \text{ kWh/bhp-hr}$. For California, GHG emissions for electricity use are 0.879 lb/kWh (per EPA eGrid emission data for California (2004)) which results in an electric motor GHG emission factor of 0.69 lb-CO₂/bhp-hr. For comparison, a standard efficiency motor at 85% has an emissions factor of 0.77 lb-CO₂/bhp-hr. As a base case to

represent equipment operated during the 2002-2004 emission inventory baseline, a natural gas-fired IC engine with a heat rate of 9500 Btu/hp-hr (HHV) is assumed which has a CO₂ emission rate of 1.11 lb-CO₂/hp-hr (approximately 10% higher than currently available engines). Comparing the natural gas engine as a base case with a premium efficiency electric motor (BPS) based on the above values, a potential GHG emission reduction of 47% is indicated.

Summary of BPS and achieved GHG emission reductions:

BPS for: Non-Emergency Mechanical Equipment Driver			
Baseline	BPS	GHG	GHG Emission Reduction (%)
Natural Gas Engine	Premium Efficiency Electric Motor	CO ₂	47%

Compliance Assurance

Since compliance with the BPS is achieved by meeting the design standard (installation of an electric motor which does not require a District permit), no enforcement provisions are applicable or necessary.

Approved Alternate Technology

Two other approved technologically feasible GHG emission reduction measures which are not achieved-in-practice, but offer GHG emissions reductions equal to or greater than the identified BPS are:

1. Power equipment using a renewable energy source such as solar or wind in lieu of fossil fuel.
2. Utilize biogenic fuel derived from renewable natural or waste sources in lieu of fossil fuel (fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria).

5. Fossil Fuel-Fired Cogeneration (combustion turbines > 3 MMBtu/hr or other combustion devices > 5 MMBtu/hour)



Illustrative BPS:

Fossil fuel- fired cogeneration systems shall be designed to achieve an incremental GHG emission rate not exceeding 700 lb-CO₂ per MWh at the system's design operating point based on power output at the generator terminals, assuming the process thermal demand could alternatively be met by direct fuel firing with 90% thermal efficiency. Heat recovery design shall maximize thermal efficiency by installing adequate heat transfer surface to provide a maximum 20 °F approach between stack gas temperature and the process inlet temperature

BPS Determination

Well-designed gas turbine cogeneration systems are generally capable of achieving incremental GHG emission rates below 700 CO₂/MWh depending upon the specific system design and the extent to which the gas turbine operating profile matches the required process thermal load. This standard provides significantly lower emissions when compared to the capacity-rated average emission factor of 915 lb-CO₂/MWh for existing base-loaded combined cycle gas turbine power plants (CCGT) in California based on 2004/2005 CEMS data as stated in the Public Utilities Commission (PUC) Decision 07-01-039 (1/25/07), Greenhouse Gas Emissions Performance Standard. A cogeneration system operating per the BPS would thus supplant base loaded CCGT electricity in California, providing an emission reduction of 915 – 700 = 215 lb-CO₂/MWh or a reduction of 24 %. The BPS also significantly exceeds the performance standard of 1,100 lb- CO₂/MWh for new base load CCGT power generation as adopted by

the PUC in the above-referenced Decision 07-01-039. Recognizing that a well designed cogeneration project can inherently produce power at a lower incremental GHG emission rate than the electric utility, selection of a BPS of 700 lb CO₂/MWh seeks to effectively promote efficient cogeneration projects by establishing a standard which generally be achieved by most commercially available gas turbines when applied to a well-designed project while establishing a significant margin below the current GHG emission rate of base loaded utility CCGTs. The heat recovery specification of this BPS requires a 20 °F approach between process inlet temperature and the stack gas temperature which ensures both a state-of-the-art efficiency in the heat recovery design and an efficient overall cogeneration system design.

Since this category of equipment generates electric power for the utility grid and would most likely supplant baseload CCGT power, equipment operated during the 2002-2004 emission inventory baseline is assumed to be the measured average for baseload CCGT power generation stated above:

Summary of BPS and achieved GHG emission reductions:

BPS For: Fossil Fuel-Fired Cogeneration			
Baseline	BPS	GHG	GHG Emission Reduction (%)
Baseload Electric Utility CCGT Power Plant	Fossil-Fueled Cogeneration System with GHG Emission Rate Not Exceeding 700 lb CO ₂ /MWh	CO ₂	24%

Compliance Assurance

The BPS for this category shall be enforced through design standards, equipment description, and permit conditions.

The following permit conditions will apply:

- In order to minimize Green House Gas emissions and optimize equipment efficiency, all equipment shall be operated in accordance with manufacturer specifications and approved design specifications. [California Environmental Quality Act]*

Approved Alternate Technology

An approved technologically feasible GHG emission reduction measure which is not achieved-in-practice, but offers GHG emissions reductions equal to or greater than the identified BPS is:

- Utilize biogenic fuel derived from renewable natural or waste sources in lieu of fossil fuel (biogenic fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria)

6. Landfill Operations

Illustrative BPS:

Landfills shall comply with CARB Regulation to Reduce Methane Emissions From Municipal Solid Waste Landfills⁸.

BPS Determination

The proposed BPS for this category represents the most stringent Achieved-in-Practice GHG emission control method and consists of the following element:



Landfills are a major source of methane emissions. Landfills shall comply with CARB Regulation to Reduce Methane Emissions From Municipal Solid Waste Landfills. As organic matter inside the landfill decomposes in the oxygen deficient subterranean environment, methane is released as a byproduct of the anaerobic decomposition. The methane migrates upwards to the surface of the landfill where it is emitted into the atmosphere through pores, cracks and fissures

on the landfill surface. Methane may also migrate through underground channels and waterways and be emitted at other locations far from the landfill.

Currently, many landfills are required to install and operate a methane capture and control system. Such a system typically consists of wells sunk into the

⁸ www.arb.ca.gov/regact/2009/landfills09/isor.pdf

landfill and connected to a vacuum pump to draw the Methane to a central location instead of allowing it to escape as fugitives from the landfill surface. Once collected, the gas may be flared or combusted in an energy recovery device such as an IC engine. The methane is converted to CO₂, which is a much less potent GHG, during the combustion. Energy recovered may also displace the use of non-renewable fossil fuels such as diesel, thereby providing an added GHG reduction benefit.

The proposed *CARB Regulation to Reduce Methane Emissions From Municipal Solid Waste Landfills*, which is due to be adopted in early 2010, will enhance capture and control of CH₄ from municipal waste landfills. The regulation is expected to reduce CH₄ emissions by about 0.07 million metric tons⁹, which represents a reduction of approximately 23.8% from current standards.

The regulations includes CH₄ reduction strategies such as installation of collection and control systems for landfills that would otherwise be exempt by current regulations, design of collection and control systems to capture maximum amounts of CH₄ produced, continuous operation of CH₄ control equipment, Improved leak standards (200 ppmv) for CH₄ collection and control system components as well as landfill surface emissions, 99% CH₄ destruction efficiency for flares and methane-fire energy recovery devices, and other enhanced source testing, inspection, monitoring and operating standards.

This BPS is considered achieved in practice because it represents a strengthening and tightening of existing CH₄ control methods, rather than an introduction of new or previously untested methods. As previously stated, many landfills are currently required to install CH₄ capture and control systems, typically consisting of collection wells connected to a vacuum pump and a flare for combustion of the captured gas. Fugitive landfill surface CH₄ emissions must also be monitored. Although not currently required, some landfills use the collected CH₄ for electricity generation or heating.

This BPS would require that additional landfills that are currently exempt or not required to install capture and control systems be required to do so. In addition, the BPS will require that the capture systems be designed for maximum extraction of CH₄ in order to minimize fugitive emissions that are often due to poor capture efficiency. The BPS will also require maximum efficiency, 99%, in the control of the captured CH₄.

Thus, all of the elements that constitute the BPS are methods currently in use in one form or another. When such control methods are applied in a more rigorous

⁹ www.arb.ca.gov/regact/2009/landfills09/isor.pdf, Page ES-2

and effective manner, over a larger number of sources, significant CH₄ reductions can be realized.

Summary of BPS and achieved GHG emission reductions:

BPS for: Landfill Operations				
Category	Baseline	BPS	GHG	GHG Emission Reduction (%)
Landfills	The baseline scenario is that some landfills are currently required to have Methane capture and control systems, but the standards are not as stringent as proposed in the BPS	Landfills shall comply with CARB Regulation to Reduce Methane Emissions From Municipal Solid Waste Landfills	CH ₄	23.8%

Compliance Assurance

The BPS for this category shall be enforced by a combination of design standards, equipment description and permit conditions.

The following permit conditions will apply:

- In order to minimize Green House Gas emissions and optimize equipment efficiency, all equipment shall be operated in accordance with manufacturer specifications and approved design specifications. [California Environmental Quality Act]*
- Landfills shall comply with all emission limits, operation, inspection, source testing and monitoring requirements as approved under the CARB Regulation to Reduce Methane Emissions From Municipal Solid Waste Landfills. [California Environmental Quality Act]*

7. Wastewater Treatment Operations

Illustrative BPS:

Wastewater treatment facilities shall incorporate both of the following two control measures:

(1) Sludge: Sludge shall be treated anaerobically in digesters, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment; and

(2) Liquid Waste: At least 33% of electricity used for liquid waste aeration shall be derived from renewable energy sources, based on grid power the Renewables Portfolio Standard (RPS), and/or supplementation of grid with onsite generation using renewable energy sources such as, but not limited to, biogas, biomass, solar, and wind.



BPS Determination

The proposed BPS for this category represents only Achieved-in-Practice emission control methods, and consists of the following elements:

1. Sludge shall be treated anaerobically in digesters, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment: Anaerobic treatment of sludge is achieved in practice because it is commonly used by municipal wastewater plants. Some smaller plants, however, may use some form of aeration or aerobic treatment for sludge.

The sludge is typically treated in a covered tank digester. The captured methane may be flared or, again depending on the size of the treatment plant, used to generate supplemental electricity onsite. Many treatment plants currently use IC engines for generation of electricity from methane, although some use fuel cells. This BPS will require anaerobic treatment of sludge, maximum capture of Methane, and the use of captured methane for energy recovery in a method that displaces current or required use of fossil fuels.

Such methods may include generation of onsite electricity using equipment, such as a fuel cell, that emits less GHG and criteria pollutants than grid power generation, the injection of purified biogas into natural gas pipeline, or compressing the gas and using it to power mobile equipment such as trucks.

2. Electricity generation using fossil fuels such as natural gas, oil and coal is a major contributor to global warming emissions, increased use of non-fossil fuels or renewable energy sources such as biogas, biomass, wind and solar will result in the reduction of GHG emissions.

Water and wastewater services account for up to 4% of all electricity consumption nationally, and 6.9% of all electricity consumption in California¹⁰. A significant proportion of this energy consumption goes toward the treatment of wastewater. Further, approximately 50% of the electricity consumed by a typical wastewater treatment plant is used for the aeration of the wastewater¹¹.

The aeration process involves the bubbling of air into the water to provide oxygen for aerobic microbes that digest organic matter in the water. Electric pumps are used to force air into the water.

Since 2002, power suppliers in California have been required to procure a certain percentage, known as the Renewables Portfolio Standard (RPS), of electricity from renewable sources. In 2002, Senate Bill 1078 set the RPS at 20% by 2017, meaning that by 2017 power suppliers were to procure at least 20% of their electricity from renewable sources. In 2003 the RPS was accelerated to 20% by 2010, and in 2008 the Governor issued an Executive Order setting a higher RPS standard at 33% by 2020.

Thus, the use of an RPS is an achieved-in-practice method for the control of emissions associated with electricity consumption. The District therefore considers the application of the current RPS to be a BPS for wastewater aeration. The proposed BPS will require wastewater facilities to implement the 33% RPS, for electricity used in wastewater aeration, as a condition of approval. Since grid power is not expected to attain a 33% RPS until 2020, facilities seeking approval prior to 2020 will have to supplement grid power with onsite generation using renewable energy sources such as, but not limited to, biogas, biomass, wind and solar.

¹⁰ <http://www.energy.ca.gov/2004publications/CEC-500-2004-901/CEC-500-2004-901.PDF>, page 2

¹¹ <http://www.energy.ca.gov/process/pubs/encina.pdf>, page 2, Aeration.

The baseline RPS, based on the AB32 scoping plan, is 12%¹². Thus, the application of a 33% RPS will result in a reduction of 21% of GHG emissions from electricity used in wastewater aeration.

Approved Alternate Technology

An approved technologically feasible GHG emission reduction measure which is not achieved-in-practice, but offers GHG emissions reductions equal to or greater than the identified BPS is:

- Wastewater shall be treated anaerobically in digesters or covered ponds, with captured Methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment.

Currently, wastewater plants separate sewage into two main streams: biosolids/sludge and liquid sewage. The biosolids are generally treated anaerobically in digesters and the produced Methane gas is captured and used for onsite electricity or heat generation. The liquid sewage is treated aerobically in large aeration ponds or ditches in which air is forcefully bubbled. Aerating the liquid sewage is a very energy intensive process, considering that oxygen is not soluble in water. If treatment of liquid sewage were to be done anaerobically there would be large reductions in the energy required for wastewater treatment, and a corresponding reduction in GHG emissions associated with power generation. In addition, anaerobic treatment of liquid sewage would produce large quantities of Methane, which can be used as a renewable energy source to replace fossil fuel use.

Since liquid waste aeration is responsible for approximately 50% of electricity consumption at a typical wastewater treatment plant, the use of anaerobic treatment of the liquid waste can cut electricity use by 50%, which represents a corresponding 50% reduction in CO₂ emissions associated with liquid waste aeration.

Anaerobic treatment is the process in which anaerobic microbes (those that do not require oxygen for respiration) digest organic matter and produce Methane and water as byproducts. Anaerobic treatment is a passive process that does not require the use of much energy, except in some cases sometimes heat is required to accelerate the process, especially in very cold climates.

Anaerobic treatment is widely used in California for onsite wastewater treatment by facilities such as dairies, wineries, cheese plants, slaughterhouses and other industrial sources use anaerobic treatment. In many cases anaerobic treatment of the wastewater is coupled with a methane capture system and the use of the

¹² http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf, Page 46.

captured methane for onsite electricity generation or heating. Several dairies have also demonstrated other renewable energy recovery methods such as injection of purified biogas into the natural gas pipeline, and use of compressed biogas as mobile equipment fuel. Such onsite treatment facilities generally handle a small quantity of wastewater with a high oxygen demand. The District also was able to identify one municipal wastewater treatment plant that uses anaerobic treatment for the liquid portion of the waste¹³. The treatment plant, located in the United Kingdom, is a small facility handling wastewater from a population of 5,000.

Based on this information, the District concluded that, although technologically feasible, anaerobic treatment of municipal wastewater, at a scale required to serve a typical city or municipality, is not achieve-in-practice.

The main difficulty with the use anaerobic treatment is the large quantity of wastewater handled at typical municipal treatments plants. Since anaerobic treatment is a much slower process requiring sequestration in ponds or tanks for at least several days, the volume and space that would be required for treatment at typical municipal plants would be prohibitive.

However, anaerobic treatment of wastewater is a field that is being actively researched. One of the main objectives of the on-going research is the reduction of the hydraulic retention time required for proper treatment time. For instance, in a recent study published in the International Journal of Environmental Science and Technology, researchers were able to demonstrate using a laboratory scale that anaerobic treatment of wastewater using a method known as Hybrid Upflow Anaerobic Sludge Blanket (HUASB) Reactor reduced the required hydraulic retention time to 3.3 hours¹⁴.

It is therefore possible that in the near future this treatment method will become more and more practical for application to large municipal wastewater treatment facilities.

¹³ <http://www.ecovation.com/installations/domestic-sewage-treatment.html>

¹⁴ Banu, J.R.; Kaliappan, S.; Yeom, I.T., (2007). Treatment of domestic wastewater using upflow anaerobic sludge blanket reactor. Int. J. Environ. Sci. Tech., 4 (3), 363-370.

Summary of BPS and achieved GHG emission reductions:

BPS for: Wastewater Treatment Operations				
Operation	Baseline	BPS	GHG	GHG Emission Reduction (%)
Sludge Treatment	Baseline period standard practice is the treatment of sludge anaerobic digesters, with energy recovery for some facilities and flaring for others	(1)Sludge shall be treated anaerobically in digesters, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment; and	CH ₄	0% (not quantifiable due to variability in current use of captured CH₄)
Wastewater Treatment	Baseline renewables portfolio, per AB32 Scoping Plan, is 12%	(2) At least 33% of electricity used for wastewater aeration shall be derived from renewable energy sources, based on grid power Renewables Portfolio Standard (RPS), and/or supplementation of grid with onsite generation using renewable energy sources such as, but not limited to, biogas, biomass, solar, and wind	CO ₂	21%
Wastewater Treatment Alternate	Aerobic treatment, requiring energy-intensive aeration	ALTERNATE for (2): Wastewater shall be treated anaerobically in digesters or covered ponds, with captured Methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment	CO ₂	50%

Compliance Assurance

The BPS for this category shall be enforced through design standards and equipment description.

The following permit condition will apply:

- *In order to minimize Green House Gas emissions and optimize equipment efficiency, all equipment shall be operated in accordance with manufacturer specifications and approved design specifications. [California Environmental Quality Act]*

8. Oil and Gas Extraction, Storage, Transportation and Refining Operations

Illustrative BPS:

Fugitive Methane emissions shall be minimized by applying VOC Leak Standards, as contained in District Rules 4409 and 4455 to components handling methane.

BPS Determination

The proposed BPS for this category represents the most stringent Achieved-in-Practice emission control method and consists of the following element:

Fugitive Methane emissions shall be minimized by applying VOC Leak Standards, as contained in District Rules 4409 and 4455 to components handling methane: These District rules are intended to minimize fugitive VOC emissions from components used in oil and gas extraction, storage, transportation, and refining.

District Rule 4409 applies to components containing or contacting VOC streams at light crude oil production facilities, natural gas production facilities, and natural gas processing facilities. District Rule 4455 applies to components containing or contacting VOC at petroleum refineries, gas liquids processing facilities, and chemical plants.

The components affected include valves, fittings, threaded connections, pumps, compressors, pressure relief devices, pipes, polished rod stuffing boxes, flanges, process drains, sealing mechanisms, hatches, sight-glasses, meters or seal fluid systems in VOC service.

The rules set leak standards ranging from 200 ppmv to 10,000 ppmv, depending on the type of component, as well as inspection and monitoring standards for all components.

Since the primary purpose of these rules is to control VOC emissions, they do not apply to components at oil production facilities and gas production facilities exclusively handling gas/vapor or liquid with a VOC content of 10% by weight or less; or components at natural gas processing facilities exclusively handling gas/vapor or liquid with a VOC content less than one 1% by weight. The rules also do not apply to components handling commercial grade natural gas.

Thus, the application of these rules to components handling Methane, or those currently exempt because they handle a larger proportion of Methane than VOC, will result in a significant reduction in fugitive Methane emissions. Such an approach therefore can be considered BPS for this category. The method is achieved in practice because the rules are currently being applied to the majority of components, including those with a certain proportion of Methane in their streams.

The District's staff report for rules 4409 and 4455 found that the implementation of these rules with stricter leak standards and increased inspection and monitoring requirements will results in a 60.2% reduction in fugitive VOC emissions. The proposed BPS assumes that a similar reduction in fugitive Methane emissions will be realized by application of the same strict leak, inspection and monitoring standards.

The California Air Resources Board (ARB) is due to promulgate a regulation in 2010 for the control of fugitive Methane emissions from the oil and gas industry. ARB has indicated that their rule is very likely to follow a similar approach as District Rules 4409 and 4455, by establishing leak standards for various components and setting strict inspection and monitoring requirements.

Summary of BPS and achieved GHG emission reductions:

BPS for: Oil and Gas Extraction, Storage, Transportation and Refining Operations				
Category	Baseline	BPS	GHG	GHG Emission Reduction (%)
Oil and gas extraction, storage, transportation and refining	No leak standards or inspection and monitoring requirements for CH ₄ currently or during baseline period of 2002 - 2004	Fugitive Methane emissions shall be minimized by applying VOC Leak Standards, as contained in District Rules 4409 and 4455 to components handling methane	CH ₄	60.2%

Compliance Assurance

The BPS for this category shall be enforced by a combination of design standards, equipment description and permit conditions.

The following permit conditions will apply:

- In order to minimize Green House Gas emissions and optimize equipment efficiency, all equipment shall be operated in accordance with manufacturer specifications and approved design specifications. [California Environmental Quality Act]*
- Oil and Gas Extraction, Storage, Transportation and Refining operations shall apply the leak standards and the inspection and monitoring plans as approved under Rules 4409 and/or 4455 to Methane emissions. [California Environmental Quality Act]*

9. Farming Operations – Livestock Rearing

Illustrative BPS:

All operations shall utilize all three following control measures:

(1) All ruminant animal feed shall include at least 6% cottonseed, or, upon District approval, based on sufficient demonstration that use of cottonseed is not feasible, an equivalent substitute; and,

(2) Manure from animal housing areas for mature cows shall be removed and transferred into appropriate treatment facilities at least four times a day and at least once a day for all other animals; and

(3) Collected manure shall be treated anaerobically in digesters or covered lagoons, designed and operated per NRCS standards, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment.



BPS Determination

The proposed BPS for this category represents the most stringent Achieved-in-Practice emission control methods and consists of the following three elements:

1. All ruminant animal feed shall include at least 6% cottonseed, or, upon District approval, based on sufficient demonstration that use of cottonseed is not feasible, an equivalent substitute: Ruminant animals such as cows and goats produce Methane from the first stomach, known as the rumen, where fermentation of animal matter is carried out by microbes. The methane is emitted through the mouth when the animal burps.

Diet management is one of the achieved-in-practice methods that can be used to reduce Methane emissions from the rumen. Since Methane is a byproduct of the fermentation of crude plant matter, a diet that incorporates nutrient

concentrates and simple sugars and limits crude plant matter will result in less Methane emissions. However, there is no reliable scientific research or data quantifying the reductions of Methane from such diets or providing specific formulas in a manner that could facilitate enforcement or monitoring.

The District was however been able to find credible scientific studies that demonstrated that a significant amount of Methane reductions, ranging from 12% to 36%, can be achieved by incorporating dietary oils such as cottonseed into ruminant animals' diets. Beauchemin et al. (2007)¹⁵ reported Methane reductions of up to 36% by feeding 6% cottonseed, while Grainger et al. (2007)¹⁶ reported a 12% Methane reduction. The District will use the more conservative 12% reduction reported by Grainger at this time.

2. Manure from animal housing areas (mature cows) shall be removed and transferred into appropriate treatment facilities at least four times a day and at least once a day for all other animals: The primary purpose of frequent removal of manure from the animal housing areas is to reduce VOC emissions from the decomposition of fresh manure. However, based on a news alert issued by Science for Environment Policy, frequent removal of manure from the housing areas has also been found to reduce GHG emissions by up to 7.1%¹⁷. Due to other requirements such as BACT and BARCT, livestock operations that are subject to District permit requirements are usually required to clean animal housing areas at least two to four times a day. It is therefore likely that GHG emission reductions will be higher for such facilities, but in order to be conservative, the District will assume only a 7.1% reduction for all facilities.
3. Collected manure shall be treated anaerobically in digesters or covered lagoons, designed and operated per NRCS standards, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment: Anaerobic treatment is the process in which Methanogenic microbes decompose or digest organic compounds in manure, in the absence of Oxygen, and produce Methane, Carbon Dioxide and water as by products. Anaerobic decomposition of manure

¹⁵ Beauchemin, K.A., Kreuzer, M., O'Mara, F., and McAllister, T.A. (2008). "Nutritional management for enteric methane abatement: a review.", *Australian Journal of Experimental Agriculture*, 48(1-2), pp. 21-27. DOI: 10.1071/EA07199.

¹⁶ Grainger, C., Clarke, T., Beauchemin, K.A., McGinn, S.M., and Eckard, R.J. (2008). "Supplementation with whole cottonseed reduces methane emissions and can profitably increase milk production of dairy cows offered a forage and cereal grain diet.", *Australian Journal of Experimental Agriculture*, 48(1-2), pp. 73-76. DOI: 10.1071/EA07224.

¹⁷ <http://ec.europa.eu/environment/integration/research/newsalert/pdf/49na1.pdf>

occurs naturally in many parts of livestock operations such as open corrals. When manure decomposes naturally, Methane is released into the atmosphere as fugitive emissions.

A critical strategy for the reduction of such fugitive Methane emissions is to collect as much of the manure as possible and subject it to anaerobic decomposition in a controlled device such as a digester or covered lagoon. The Methane emitted from such a treatment device is easily captured and used for energy recovery to displace the use of fossil fuels and to convert it to Carbon Dioxide, which has a much lower global warming potential.

In most typical livestock operations such as dairies, it is feasible to collect, on average, approximately 71% of the manure by designing the animal housing and feeding areas so that most of the manure is deposited on paved lanes that can be flushed or vacuumed. Methane produced from the collected manure can be captured with an estimated effectiveness of 95%.

The captured methane will be used for energy recovery in a manner that will displace the use of non-renewable fossil fuels and will also not significantly increase criteria pollutants such as NO_x. The capture methane can be utilized, but not limited to, injection into the natural gas pipeline, or powering mobile equipment such as farm trucks. It is estimated that combustion of biomethane for energy recovery will convert up to 99% of the Methane into Carbon Dioxide. Taking the effect of the CO₂ produced from the combustion of CH₄ into account, an overall reduction of 63.5% of fugitive CH₄ emissions can be achieved by the use of properly designed and controlled anaerobic treatment as a BPS.

The expected reduction is calculated as follows:

$$\begin{aligned}\text{Percentage of Methane reduced} &= [\text{Percentage of manure collected into} \\ &\text{digester} \times \text{percentage of methane captured from digester} \times \text{percentage of} \\ &\text{methane converted to CO}_2] - [\text{methane equivalent of CO}_2 \text{ produced, as a} \\ &\text{percentage of methane combusted}] \\ &= [71\% \times 95\% \times 99\%] - [71\% \times 95\% \times 99\%]/21 \\ &= 66.7\% - 3.2\% \\ &= 63.5\%.\end{aligned}$$

The use of bio-methane to displace gasoline results in a 25.2% reduction in CO₂ emissions, as discussed below, assuming compressed bio-methane to be in all respects similar to compressed natural gas:

According to the California Climate Action Registry General Reporting Protocol (Carbon Dioxide Emission Factors for Transport Fuels, Page 94),

gasoline emits 8.81 kg CO₂ per gallon, while compressed natural gas emits 5.31 Kg CO₂ per Therm.

1 Therm = 100,000 Btu

Energy content of 1 gallon of gasoline = 124,000 Btu

Adjusting the gasoline CO₂ emission factor to 100,000 Btu, $(8.81/1.24) = 7.10$ Kg CO₂ per Therm.

Reduction in CO₂ = $7.10 - 5.31 = 1.79$

% reduction = $1.79/7.10 \times 100 = 25.2\%$

The use of captured methane to displace diesel results in a 27.3% reduction in CO₂ emissions, as discussed below, assuming compressed bio-methane to be in all respects similar to compressed natural gas:

According to the California Climate Action Registry General Reporting Protocol (Carbon Dioxide Emission Factors for Transport Fuels, Page 94), diesel emits 10.15 kg CO₂ per gallon, while compressed natural gas emits 5.31 Kg CO₂ per Therm.

1 Therm = 100,000 Btu

Energy content of 1 gallon of diesel = 139,000 Btu

Adjusting the diesel CO₂ emission factor to 100,000 Btu, $(10.15/1.39) = 7.30$ Kg CO₂ per Therm.

Reduction in CO₂ = $7.30 - 5.31 = 1.99$

% reduction = $1.99/7.30 \times 100 = 27.3\%$

The baseline emissions for the livestock operations can be assumed to be the same as the 2002 – 2004 used by the AB32 Scoping Plan, since livestock operations have not changed much since that period. Although permit requirements for many livestock farms took effect in 2004, the particular BPS proposed, with the exception of frequent manure removal from livestock housing areas, have never been implemented as mandatory permit requirements. Instead, many other control measures aimed at reducing VOC and PM10 emissions have been applied with greater emphasis.

Summary of BPS and achieved GHG emission reductions:

BPS for: Farming Operations - Livestock Rearing				
Category	Baseline	BPS	GHG	GHG Emission Reduction (%)
Farming Operations - Livestock rearing	Farming operations were not subject to permit regulations until January 1, 2004, hence no enforceable emission reduction requirements were in place during 2 of the 3 baseline years of 2002 to 2004. There is currently no ruminant feed content requirement	(1) All ruminant animal feed shall include at least 6% cottonseed, or, upon District approval, based on sufficient demonstration that use of cottonseed is not feasible, an equivalent substitute; and	CH4	12.0%
		(2) Manure from animal housing areas for mature cows shall be removed and transferred into appropriate treatment facilities at least four times a day and at least once a day for all other animals; and	CH4	7.1%
	Even though removal of manure 4 times a day for mature cows is currently required as BACT, there is no corresponding anaerobic treatment requirement, hence no effect on CH4	(3) Collected manure shall be treated anaerobically in digesters or covered lagoons, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment	CH4	63.5%

Compliance Assurance

The BPS for this category shall be enforced by a combination of design standards, equipment description, and permit conditions.

The following conditions will apply:

- *In order to minimize Green House Gas emissions and optimize equipment efficiency, all equipment shall be operated in accordance with manufacturer specifications and approved design specifications. [California Environmental Quality Act]*
- *All ruminant animal feed shall include at least 6% cottonseed. [California Environmental Quality Act]*
- *Manure from animal housing areas shall be removed and transferred into appropriate treatment facilities at least four times a day for mature cows and at least once a day for all other animals. [California Environmental Quality Act]*

10. Farming Operations – Application of Manure to Cropland at Livestock Rearing Operations

Illustrative BPS:

Manure shall be incorporated into soil within 24 hours after application.

BPS Determination

The proposed BPS for this category represents the most stringent Achieved-in-Practice emission control method and consists of the following element:



Manure shall be incorporated into soil within 24 hours after application: The most significant GHG emitted from the application of manure to cropland is Nitrous Oxide (N₂O), which has a Global Warming Potential of 310. This gas is emitted as a byproduct when microbes in the soil convert Nitrogen in manure into Nitrates (Nitrification) and also when the reverse process of denitrification, in which Nitrates are converted into Nitrogen, occurs.

One of the most important methods for the reduction of N₂O emissions is the reduction of manure and fertilizer applied to cropland. This is because quantity of Nitrogen compounds in the soil, in the form of excess manure or fertilizer that is not taken up by crops, is a major driving factor in the production of N₂O. However, there are no scientific studies or data that can be used to determine the

proper manure or fertilizer application rates that will minimize excess Nitrogen in the soil. Moreover, due to complications associated with regulating farming operations, it is unlikely that any BPS mandating limits on the use of manure or fertilizer for crop fertilization will be feasible.

Another GHG emitted from the application of manure to cropland is Methane. Methane is naturally present in manure that is decomposing under anoxic conditions, such as manure stored in poorly aerated piles.

In a report entitled *“Recommendations to the San Joaquin valley Air Pollution Control Officer Regarding Best Available Control Technology for Dairies in the San Joaquin Valley”*, the Dairy Permitting Advisory Group (DPAG) concluded that VOC emissions could be reduced by 29-58% by the prompt incorporation of manure into soil after application to land. Based on this information, this BPS assumes a similar benefit as far as the reduction of CH₄ emissions is concerned. However due to the lack of data, the lower control efficiency of 29% will be used. The BPS assumes that incorporating into soil will allow at least a small percentage of CH₄ to be assimilated into other complex organic compounds in the soil instead of being emitted directly into the atmosphere. In addition, certain soil microbes are also able to metabolize CH₄ into CO₂, hence reducing total CH₄ emissions when incorporation into soil is used.

Manure also produces Carbon Dioxide when it decomposes aerobically upon exposure to air as is the case during land application. Also, as previously discussed, soil incorporated CH₄ may be further metabolized into CO₂ by soil microbes. However, there is no BPS that can effectively reduce CO₂ emissions from the application of manure to cropland.

The emissions for land application of manure can be assumed to be the same as emissions occurring during the 2002 – 2004 baseline years used by the AB32 Scoping Plan. Manure application operations have not changed much since that period. Although permit requirements for many farming operations took effect in 2004, the particular BPS proposed has generally not been implemented as mandatory permit requirement. Instead, many other control measures aimed at reducing PM₁₀ emissions have been applied with greater emphasis.

Summary of BPS and achieved GHG emission reductions:

BPS for: Farming Operations – Application of Manure to Cropland				
Category	Baseline	BPS	GHG	GHG Emission Reduction (%)
Farming Operations - Land application of manure	Farming operations were not subject to permit regulations until January 1, 2004, hence no enforceable emission reduction requirements were in place during 2 of the 3 baseline years of 2002 to 2004. Incorporation of land applied manure is currently required as BACT, but there is no specific time period within which manure must be incorporated	Manure shall be incorporated into soil within 24 hours after application	CH ₄	29%

Compliance Assurance

The BPS for this category shall be enforced by permit condition.

The following condition will apply:

- *Manure shall be incorporated into soil within 24 hours after application.
[California Environmental Quality Act]*

5.4.3 Best Performance Standards for Development Projects

Introduction

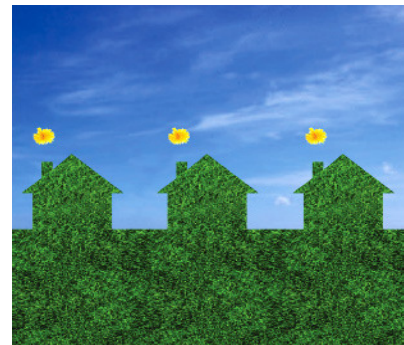
As presented previously in Chapter 1, Figure 1: *California's Greenhouse Gas Emissions by Sector*, the Commercial and Residential sectors represents nine (9) percent of the State's greenhouse gas (GHG) emissions inventory. Greenhouse gas (GHG) emissions from development projects result from operational and transportation related activities. GHG emissions from operational activities are dominated by energy consumed for space and water heating, lighting, and operation of electrical appliances. GHG emissions from transportation activities are dominated by consumption of gasoline and diesel for movement of goods and people.

In characterizing GHG emissions from the Commercial and Residential sectors, the 1990 emissions set by the California Air Resources Board (ARB) are based on fuel use activities which comprise more than 80 percent of the overall 1990 statewide greenhouse gas emissions. The forecasted 2020 business-as-usual emissions developed by ARB considered GHG emissions contributions resulting from energy consumption only (e.g.: natural gas, distillate, wood, and diesel)¹⁸. Thus, reducing GHG emissions from these sectors has significant overlap with energy efficiency and conservation measures (E-1 and CR-1) addressed in ARB's *Climate Change Proposed Scoping Plan*-Electricity Generation sector that was adopted by ARB's Board in December 2008.

5.4.3.1 GHG Emissions and Reduction Measures

5.4.3.1.1 Energy Efficiency and Conservation

The Electricity Generation sector overlaps and intercepts many of the GHG sectors identified by ARB. Generating electricity consumes about half of all natural gas in the state, making electricity production the single largest consumer of natural gas. The Residential sector consumes another 22 percent of the state's total natural gas consumption; 88 percent of which is used for space and water heating¹⁹. Comprising 23 percent of the state's total GHG emissions, the Electricity Generation sector is



¹⁸ Staff report – *California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*. California Air Resources Board, November 16, 2007

¹⁹ *Integrated Energy Policy Report, 2007 Summary*, P.18. California Energy Commission.

California's second largest source of GHG emissions. The Transportation sector is number one, responsible for 38 percent of the State's GHG emissions.

Strategies for reducing GHG emissions from the Electricity Generation sector include reducing the amount of energy consumed and reducing GHG emissions resulting from electricity production. Of these two strategies, the California Energy Commissions (CEC) has determined that reducing GHG emissions depends largely on the success of California's energy efficiency and renewable energy programs²⁰. The importance of increasing energy efficiency is mirrored by ARB's determination that increasing energy efficiency will be California's most effective tool for achieving GHG reductions in the Electricity Generation sector²¹.

Existing progressive green building standards provide a starting point for performance standards. Existing green building rating systems like LEED (Leadership in Energy and Environmental Design), the California Green Building Code, and others, contain examples of measures that are likely to result in substantial GHG emission reductions from residential and commercial projects.

As presented below in Table 2, ARB has proposed 12 strategies for maximizing energy efficiency, four of which are based on further development of the State's building and appliance energy efficiency codes and standards.

²⁰ *Integrated Energy Policy Report, 2007 Summary*, P.6. California Energy Commission.

²¹ *Climate Change Proposed Scoping Plan Appendices; Vol. I, Electricity and Natural Gas*. P.C-87. California Air Resources Board, October 2008

Table 2- Twelve Strategies for Maximizing Energy Efficiency²²

• Cross-cutting Strategy for Buildings
○ “Zero Net Energy” Buildings
• Codes and Standards Strategies
○ More stringent building codes and appliance standards
○ Broader standards for new types of appliances and for water efficiency
○ Improved compliance and enforcement for existing standards
○ Voluntary efficiency and green building targets beyond mandatory codes
• Strategies for Existing Buildings
○ Voluntary and mandatory whole-building retrofits for existing buildings
○ Innovated financing to overcome first-cost and split incentives for energy efficiency, on-site renewables, and high efficiency distributed generation
• Existing and Improved Utility Program Strategies
○ More aggressive utility programs to achieve long-term savings
• Other Needed Strategies
○ Water system and water use efficiency and conservation measures
○ Local government programs that lead by example and tap local authority over planning, development, and code compliance
○ Additional industrial and agricultural efficiency efforts
○ Providing real time energy information to help customers conserve
○ and optimize energy performance

5.4.3.1.2 Building and Appliance Standards

Under California Public Resources Code, the CEC is authorized to adopt and update Building Efficiency Standards and Appliance Efficiency Regulation. Building standards include both prescriptive and performance standards for new construction, and for alterations and additions to existing buildings. The standards include pre-defined performance levels for various building components and energy consumption. Examples of such standards are new Cool Roof requirements, mechanical ventilation requirements, compliance option

²² *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Electricity and Natural Gas. P.C-100. California Air Resources Board, October 2008

credits for distributed energy storage, and calculation of Time Dependent Valuation energy.

Because most of California's older buildings were built to lesser or non-existent building efficiency standards, improving the energy efficiency of existing residential and commercial buildings in California could produce substantial GHG benefits. In fact, improving the efficiency of California's existing building stocks is the single most important activity to reduced GHG emissions within the electricity and natural gas sectors²³. New standards will become in effect in August 2009.

California's Appliance Efficiency Regulations include standards for both federally and non-federally regulated appliances. The standards apply to appliances sold or offered for sale in California, with a few exceptions. Appliance standards improve the operation and efficiency of refrigerators, freezers, air conditioners and other appliances. Normally, the CEC updates building standards on a three-year cycle. The most recent update occurred in 2008, and several updates are expected to occur between now and 2020²⁴. As with building standards, the CEC establishes appliance standards at its discretion. The most recent update occurred in 2007, and several updates are expected to occur between now and 2020²⁵.

As presented in ARB's Scoping Plan, the California Public Utilities Commission working with the CEC, California's Investor owned utilities (IOUs) and numerous stakeholders, prepared the Long Term Energy Efficiency Strategic Plan. This long-term plan recommends strategies that can enable the utilities and other factors to achieve energy efficiency goals for the 2009-2020 period and beyond, contributing ignorantly to the State's AB 32 goals. Two targets adopted by the CPUC, and supported by the CEC, are as follows:

1. By 2020, all new residential buildings will be zero net energy; and
2. By 2030, all new commercial buildings will be zero net energy²⁶.

Zero net energy building, which is yet to be defined by energy agencies, would be those that are very energy efficient and generate

²³ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Electricity and Natural Gas. P.C-108. California Air Resources Board, October 2008

²⁴ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Electricity and Natural Gas. P.C-104. California Air Resources Board, October 2008

²⁵ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Electricity and Natural Gas. P.C-104. California Air Resources Board, October 2008

²⁶ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Electricity and Natural Gas. P.C-112. California Air Resources Board, October 2008

enough energy on-site to completely offset the energy consumed within the building over the course of a year.

5.4.3.1.3 Green Building Strategy

“Green buildings” are designed, built, operated, renovated, and maintained using an integrated approach that creates and ensures a healthy and comfortable environment while maximizing energy and resource efficiencies²⁷. As concluded by ARB, the design, construction, demolition, renovation, maintenance and operation of buildings together account for considerable electricity, and natural gas demand. Water usage and waste generation further contributes to GHG emissions. Mining, harvesting, processing, and transportation of building materials used in construction, and products used in the operation of buildings, accounts for further GHG emissions. The choice of where buildings are sited and how they are integrated within communities also affects transportation patterns and infrastructure needs resulting in potentially significant GHG impacts. The *Climate Change Proposed Scoping Plan* (adopted by ARB Board in December 2008) includes a Green Building Strategy that when implemented will further reduce GHG emissions from both existing and new buildings.

5.4.3.1.4 Vehicle Use

GHG emission from vehicle use is the other factor contributing to GHG emissions from development projects and overlap with emission reductions targeted by ARB under the Transportation sector of the *Climate Change Proposed Scoping Plan*. As determined by ARB, the Transportation sector is responsible for 38 percent of the State’s GHG emissions. ARB has established three overarching strategies for reducing GHG emissions from vehicle use: more efficient vehicles, lower-carbon fuels, and reduction in vehicle miles traveled (VMT)²⁸. ARB has stated that these strategies will be achieved through regulations, market mechanisms, and land use policy. ARB’s recommended actions to reduce GHG emissions from the Transportation sector are listed below in Table 3.

²⁷ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Electricity and Natural Gas. P.C-138. California Air Resources Board, October 2008

²⁸ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Transportation. P.C-55. California Air Resources Board, October 2008

Table 3: Actions for Reducing Transportation GHG Emissions²⁹

• California Cap-and-Trade Program linked to the Western Climate Initiative
• Pavley I and Pavley II – Light-Duty Vehicle Standards
• Vehicle Efficiency Measures
• Low-Carbon Fuel Standard
• Ship Electrification at Ports
• Goods Movement Efficiency Measures
• Heavy-Duty Vehicle GHG Emission Reduction – Aerodynamic Efficiency
• Medium- and Heavy-Duty Vehicle Hybridization
• Regional Transportation-Related Greenhouse Gas Targets
• High Speed Rail

5.4.3.1.5 Regional Transportation-Related Greenhouse Gas Targets³⁰

Transportation planning is done on a regional level in major urban areas, reflecting local land use patterns and decisions. Through regional planning efforts, such as the “Blueprint” planning model, regions can select future growth scenarios that lead to more environmentally and economically sustainable and energy efficient communities. Senate Bill 375 (SB 375) (Steinberg, Chapter 728, Statutes of 2008) establishes mechanisms for the development of regional GHG reduction targets for passenger vehicle. Under SB 375, ARB is required to develop, in consultation with metropolitan planning organizations (MPOs) passenger vehicle GHG reduction targets for 2020 and 2035. The bill creates incentives for local governments and developers by providing relief from certain CEQA requirements for development projects that are consistent with regional plans that achieve the GHG reduction targets.

5.4.3.1.6 GHG Baseline & Business as Usual Emissions

ARB estimated the statewide 1990 greenhouse gas emissions level of 427 MMT CO₂E based on data from State and federal agencies, international organizations, and California industries. Upon approval by

²⁹ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Transportation. P.C-55. California Air Resources Board, October 2008

³⁰ *Climate Change Proposed Scoping Plan Appendices*; Vol. I, Transportation. P.C-75. California Air Resources Board, October 2008

ARB's Board in December 2007, the 1990 emissions level became the 2020 emissions limit, which represents an aggregated emissions limit for California. The gross statewide emissions in 1990 were 433 MMT CO₂E with forestry sinks offsetting approximately 7 MMT CO₂E, resulting in net emissions to the atmosphere of approximately 427 MMT CO₂E. The 1990 emissions level is a compilation or inventory of the amount and type of greenhouse gases emitted by different sources on an annual basis³¹. The resulting 2020 BAU estimates of 596 MMT CO₂E are compared to the 1990 level target for 2020 of 427 MMT CO₂E in yr 1990 to determine the total statewide GHG reductions needed which is 169 MMT CO₂E or approximately 30% reduction.

The California Air Resources Board (ARB) forecasting approach for BAU greenhouse gas emissions in 2020 uses emissions estimates from 2002 through 2004 to develop baseline GHG emissions from which to grow emissions into the future³². The 3-year average baseline emissions estimate of 2002-2004 includes emissions from older, less energy efficient structures and emissions from structures built to comply with building and appliance standards in effect during the baseline years. Based on the GHG emissions ARB determined, in order to achieve the GHG reduction targets established in AB 32 development projects after 2004 would need to reduce GHG emissions by about 10% from the 1990 emissions and for all sectors altogether by about 30% from BAU emissions as projected for 2020.

5.4.3.1.7 Achieved GHG Emission Reductions

Building and appliance standards are critical tools in reducing energy demand. During the baseline years of 2002-2004, all new construction was required to comply with building standards adopted in 2001. Building and Appliance standards have been revised since 2004. Each successive version of the building and appliance standards requires new technologies and tighter performance standards, thus, reducing GHG emissions from new development projects, as well as reducing emissions from renovation of older structures³³. The building standards were updated in 2005 and new 2008 standards have been published that take effect in 2009. The 2009 standards contain numerous

³¹ *Business-as-Usual Forecasting Method Summary*, P. 1. California Air Resources Board, July 30, 2008

³² *California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit*; P. 2. California Air Resources Board, November 16, 2007

³³ *Climate Change Proposed Scoping Plan Appendices; Vol. I, Electricity and Natural Gas*. P.C-104. California Air Resources Board, October 2008

requirements for improving energy efficiency in both residential and non-residential structures. The appliance standards were updated in 2003, 2005 and again in 2006, with further updates planned. Thus, it is reasonable to conclude that new development projects occurring after 2004 are already implementing measures that reduce GHG emissions below the 2002-2004 emissions.

As presented below in Tables 4 and 5, preliminary estimates by the District show that 2007 residential use of natural gas is about 20% less than the 2002-2004 baseline period. Reducing natural gas consumption should result in a concomitant reduction in GHG emissions. Thus, these data suggest that new residential developments may already be emitting less GHG emissions than the 2002-2004 baseline period. CEC also has data demonstrating that although the number of residential customers have increased, the average household use has been reduced as a result of the appliance and building energy efficiency standards³⁴.

Emission reduction targets established by ARB are based on average fuel consumption for the baseline year. Therefore, emission reductions occurring after the baseline year should be credited towards the achieving the required percent reduction. The District recognizes that this apparent reduction may be influenced by other factors other than building and appliance standards and that commercial development may not have experienced equivalent reductions. Before finalizing its determination, the District will conduct a more detailed analysis of development project energy consumption and associated emission reductions.

Table 4: 2002-2004 Per capita GHG Emissions from natural gas - Residential

	CA MTCO ₂ ¹	SJV MTCO ₂	SJV average household ²	MTCO ₂ per Dwelling Unit
Residential	26.87	2.821	1,161,751.00	0.0000024

Notes:

- ¹ Excel with embedded PDF document, Air Resources Board, <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>
- ² From E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark, California Energy Commission, <http://www.cedf.ca.gov/research/demographic/reports/estimates/e-5/2009/>
- It is assumed that natural gas consumption for San Joaquin Valley (SJV) is about 10.5% of California's.

Table 5: 2007 Per capita GHG Emissions from natural gas - Residential

³⁴ California Residential Natural Gas Consumption,
http://energyalmanac.ca.gov/naturalgas/residential_natural_gas_consumption.html

	SJV MTCO ₂ ¹	SJV average household ²	MTCO ₂ per Dwelling Unit
Residential	3	1,304,301.00	0.0000019

Notes:

⁻¹ Calculated value based on data from California Energy Consumption Database, <http://www.ecdms.energy.ca.gov/> and methodologies by Air Resource Board, <http://www.arb.ca.gov/cc/inventory/1990level/1990level.htm>

⁻² From E-5 Population and Housing Estimates for Cities, Counties and the State, 2001-2009, with 2000 Benchmark, California Energy Commission, <http://www.cedf.ca.gov/research/demographic/reports/estimates/e-5/2009/>

5.4.4 Energy Efficiency and Land Use Planning

As previously discussed, GHG emissions from commercial and residential develop are dominated by building and appliance energy efficiencies and GHG emissions resulting from movement of goods and people. Thus, there is considerable overlap between Commercial and Residential sectors and the Electricity Generation and Transportation Sectors.

In developing its recommendations for approved GHG emission reduction measures for development projects, the District considered the extent to which development projects will be subject to GHG emission reduction requirements imposed by ARB and other state agencies with statutory authority for reducing GHG emissions from development projects. Additionally, the District considered GHG emission reductions that have already been achieved as a result of changes to the building and appliance standards adopted by the CEC after the 2002-2004 baseline period.

5.4.4.1 Energy Efficiency and Conservation GHG Emission Reduction Measures

As previously discussed, the CEC has statutory authority for establishing performance standards for building and appliance efficiencies. California's per capita electricity use has stayed flat for the past 30 years because of efficiency standards and utility efficiency programs³⁵.

The California Public Utilities Commission and the California Energy Commission provided their recommendations to ARB on strategies for reducing GHG emissions in the electricity and natural gas sectors³⁶. Included in their evaluations for potential areas of GHG emissions

³⁵ *Integrated Energy Policy Report 2007 Summary*. California Energy Commission. 2007

³⁶ *Final Opinion and Recommendations on Greenhouse Gas regulatory Strategies*. CA Energy Commission & CA public Utilities Commissions, October 2008

reductions is the energy efficiency through codes and standards. The CEC has set the 2008 standards for building energy efficiency standards which are to be in effect as of January 1, 2010.

The CEC and the Climate Action Team Energy Subgroup have the necessary expertise and statutory authority for establishing performance standard for building and appliance standards. The CEC and Climate Change Action Team Energy Subgroup have already done outstanding research and brought forth recommendations to ARB. The measures or areas identified for the energy sector are already those that would bring the majority of the reductions and already reflect the best practices in energy efficiency.

The District concludes that for commercial and residential developments, compliance with building and appliance standards established by CEC reduces project specific GHG emissions and thus, constitutes a valid GHG emission reduction measure for energy efficiency and conservation.

5.4.4.2 Land Use Planning GHG Emission Reduction Measures

Reducing vehicular emissions from commercial and residential developments overlap emission reductions targeted by ARB under the Transportation sector of the *Climate Change Proposed Scoping Plan*. ARB has established three overarching strategies for reducing GHG emissions from vehicle use: more efficient vehicles, lower-carbon fuels, and reduction in vehicle miles traveled (VMT). Local governments have the ability to directly influence both siting and design of new residential and commercial developments in a way that reduces vehicle miles traveled (VMT). Reductions in VMT can be achieved through diversified land use patterns that provide people greater access to alternative forms of transportation, including transit, biking and walking. Reductions in VMT can be achieved through diversified land use patterns where people can live, work, and play without having to drive great distances. Land use planning that reduces VMT can also reduce the GHG emissions by reducing land consumption, energy use, water use, and waste.

Potential reductions in GHG emissions from land use planning are established through Senate Bill 375 (SB375). The bill focuses on housing and transportation planning decisions to reduce fossil fuel consumption and conserve farmlands and habitat. It allows an opportunity to provide incentives to locate housing developments closer

to where people work and go to school, allowing them to reduce vehicle miles traveled every year. SB375 integrates AB 32's goal to reduce GHG emissions into transportation planning by requiring that a sustainable communities strategy be added to the regional transportation Plan. SB 375 also directs ARB to work with California's Metropolitan Planning Organizations to align their regional transportation, housing and land-use plans and prepare a "sustainable communities strategy" to reduce the amount of vehicle miles traveled in their respective regions and demonstrate the region's ability to attain its greenhouse gas reduction targets to be achieved from the automobile and light truck sectors for 2020 and 2035. When it is determined that the SCS cannot achieve the targets, the Metropolitan Planning Organization The must develop an Alternative Planning Strategy.

Per guidance provided by OPR, CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less than significant level.

5.4.5 Illustrative GHG Emission Reduction Measures for Development Projects

Both GHG and criteria pollutant emissions from development projects are direct results of energy consumption and vehicle miles traveled. Land use decisions that would impact GHG emissions are the same land use decisions that would impact criteria pollutant emissions from development projects. The District, through implementation of District Rule 9510 (Indirect Source Review) has considerable experience with evaluating criteria pollutant emissions from development projects, and evaluating the mitigating effects of project design elements.

Any combination of approved GHG emissions reduction measures achieving a combined 29% of GHG emissions compared to the established Baseline GHG emissions factor per unit of activity is considered **Best Performance Standard** (BPS) for the respective type of development project. Projects achieving a 29% reduction in GHG emissions would be determined to have a less than significant individual and cumulative impact for GHG emissions. To be considered to have a less than significant individual and cumulative impact for GHG emissions, projects not achieving a 29% reduction would require quantification of GHG emissions and demonstration that GHG emissions have been reduced or mitigated by 29%, including GHG emission reductions achieved since the 2002-2004 baseline.

The following discussion illustrates possible GHG emission reduction measure, as presented in Appendix J, for development projects (residential, commercial and industrial) and provides the basis and/or rationale for each, as well as an assessment of potential GHG emissions reduction impact relative to a 2002-2004 emissions inventory baseline. It should be noted that these examples of BPS are for illustrative purposes only, and should not be used by any lead agency as District-approved or sanctioned standards. As discussed further in this staff report, the proposed process of establishing BPS provides opportunity for public input into the development of BPS.

To simplify the evaluation process, the District will develop a point system and tools for use by lead agencies to score the effectiveness of the achieved BPS. An important effort that will contribute to the establishment of GHG Emission Reduction Measures for development projects is the ongoing work by the California Air Pollution Control Officers Association (CAPCOA) to identify and quantify control efficiencies for development mitigation measures reducing GHG and criteria pollutant emissions. The District is an active participant in the CAPCOA effort.

The illustrative GHG Emission Reduction Measures table lists the mitigation measures that relate to bicycle/pedestrian use, transit, parking, commercial and residential development design, building design, and commuting (See Appendix J). Each measure has been assigned a land use type for which a point value in reduction may be claimed. The point values are used to quantify the approximate emission reduction factor associated with a particular mitigation measure. The land use types include residential (R), commercial (C), and mixed-used (M). Each point associated with a particular measure is equivalent to an equal percentage of emission reductions. For example, implementing mitigation measures in a project that adds up to 15 mitigation points means that the measures are anticipated to achieve a 15% reduction in project related GHG operational emissions. The demonstrated GHG emission reductions would be added to the GHG emission reductions achieved since the 2002-2004 baseline.

BICYCLE/PEDESTRIAN/TRANSIT MEASURES

1. Bike Parking Measure - Commercial, Mixed-Use

Measure Description

Non-residential projects provide plentiful short-term and long-term bicycle parking facilities to meet peak season maximum demand. Short term facilities are provided at a minimum ratio of one bike rack space per 20 vehicle spaces. Long-term facilities provide a minimum ratio of one long-term bicycle storage space per 20 employee parking spaces.



Reduction Methodology & Source³⁷

As a rule of thumb, the Center for Clean Air Policy (CCAP) guidebook attributes a 1% to 5% reduction associated with the use of bicycles, which reflects the assumption that their use is typically for shorter trips. Based on the CCAP guidebook, the TIAX report allots 2.5% reduction for all bicycle-related measures and a 1/4 of that for this measure alone. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.



Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.625%.

³⁷ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

2. End of Trip Facilities Measure - Commercial, Mixed-Use

Measure Description

Non-residential projects provide “end-of-trip” facilities including showers, lockers, and changing space. Facilities shall be provided in the following ratio: four clothes lockers and one shower provided for every 80 employee parking spaces. For projects with 160 or more employee parking spaces, separate facilities are required for each gender.

Reduction Methodology & Source³⁸

The Transportation Demand Management (TDM) Encyclopedia allows a 2-5% reduction for worksite showers and lockers. The CCAP guidebook attributes a 1% to 5% reduction associated with the use of bicycles, which reflects the assumption that their use is typically for shorter trips. Based on the CCAP guidebook, the TIAX report allots 2.5% reduction for all bicycle-related measures and a 1/4 of that for this measure alone. Source: TDM Encyclopedia May 11, 2006; CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.625%.

3. Bike Parking at Multi-Unit Residential Measure - Residential

Measure Description

Long-term bicycle parking is provided at apartment complexes or condominiums without garages. Project provides one long-term bicycle parking space for each unit without a garage. Long-term facilities shall consist of one of the following: a bicycle locker, a locked room with standard racks and access limited to bicyclists only, or a standard rack in a location that is staffed and/or monitored by video surveillance 24 hours per day.

Reduction Methodology & Source³⁹

As a rule of thumb, the CCAP guidebook attributes a 1% to 5% reduction associated with the use of bicycles, which reflects the assumption that their use is typically for shorter trips. Based on the CCAP guidebook, the TIAX report allots 2.5% reduction for all bicycle-related measures and a 25% of that for this measure

³⁸ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

³⁹ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

alone. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.625%.

4. Proximity to Bike Path/Bike Lanes Measure - Commercial, Mixed-Use, Residential

Measure Description

Entire project is located within 1/2 mile of an existing Class I or Class II bike lane and project design includes a comparable network that connects the project uses to the existing offsite facility. Existing facilities are defined as those facilities that are physically constructed and ready for use prior to the first 20% of the projects occupancy permits being granted. Project design includes a designated bicycle route connecting all units, on-site bicycle parking facilities, offsite bicycle facilities, site entrances, and primary building entrances to existing Class I or Class II bike lane(s) within 1/2 mile. Bicycle route connects to all streets contiguous with project site. Bicycle route has minimum conflicts with automobile parking and circulation facilities. All streets internal to the project wider than 75 feet have class II bicycle lanes on both sides.

Reduction Methodology & Source⁴⁰

As a rule of thumb, the CCAP guidebook attributes a 1% to 5% reduction associated with the use of bicycles, which reflects the assumption that their use is typically for shorter trips. Based on the CCAP guidebook, the TIAX report allots 2.5% reduction for all bicycle-related measures and a 1/4 of that for this measure alone. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.625%.

⁴⁰ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

5. Pedestrian Network Measure - Commercial, Mixed-Use, Residential

Measure Description

The project provides a pedestrian access network that internally links all uses and connects to existing external streets and pedestrian facilities. Existing facilities are defined as those facilities that are physically constructed and ready for use prior to the first 20% of the projects occupancy permits being granted. The project provides a pedestrian access network that internally links all uses for connecting to planned external streets and pedestrian facilities (facilities must be included pedestrian master plan or equivalent).

Reduction Methodology & Source⁴¹

Because this measure also eliminates physical barriers between residential and non-residential uses that impede bicycle or pedestrian circulation, this measure is similar in nature to 6. As cited in the TIAX report, the CCAP guidebook attributes a 1% reduction in VMT. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is between 0.5% and 1.0%.

6. Pedestrian Barriers Minimized - Commercial, Mixed-Use, Residential

Measure Description

Site design and building placement minimize barriers to pedestrian access and interconnectivity. Physical barriers such as walls, berms, landscaping, and slopes between residential and non-residential uses that impede bicycle or pedestrian circulation are eliminated. Barriers to pedestrian access of neighboring facilities and sites are minimized. This measure is not meant to prevent the limited use of barriers to ensure public safety by prohibiting access to hazardous areas, etc..

Reduction Methodology & Source⁴²

The reduction is based on the TIAX report, which indicates a 1% reduction, and the CCAP report, which attributes a 1% to 5% reduction. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Achieved GHG Emission Reductions

⁴¹ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

⁴² *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

With this measure the estimated achieved GHG emission reduction is 1.0%.

7. Bus Shelter for “existing” Transit Service Measure - Commercial, Mixed-Use, Residential

Measure Description

Bus or Streetcar service provides headways of one hour or less for stops within 1/4 mile; project provides safe and convenient bicycle/pedestrian access to transit stop(s) and provides essential transit stop improvements (i.e., shelters, route information, benches, and lighting).

Reduction Methodology & Source⁴³

This reduction is based on the assumption that the measure applies to providing bus stop route information & benches. Emission reductions are based on conclusion obtained from the TIAX report and the CCAP guidebook. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.5%.

8. Bus Shelter for “planned” Transit Service - Commercial, Mixed-Use, Residential

Measure Description

Project provides transit stops with safe and convenient bicycle/pedestrian access. Project provides essential transit stop improvements (i.e., shelters, route information, benches, and lighting) in anticipation of future transit service. If measure 7 is selected, it excludes this measure.

Reduction Methodology & Source⁴⁴

This reduction is based on the assumption that the measure applies to providing bus stop route information & benches. Emission reductions are based on conclusion obtained from the TIAX report and the CCAP guidebook. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by TIAX on behalf of SMAQMD.

Achieved GHG Emission Reductions

⁴³ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

⁴⁴ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

With this measure the estimated achieved GHG emission reduction is 0.25%.

9. Traffic Calming Measure - Commercial, Mixed-Use, Residential

Measure Description

Project design includes pedestrian/bicycle safety and traffic calming measures in excess of jurisdiction requirements. Roadways are designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips by featuring traffic calming measures. Traffic calming measures include: bike lanes, center islands, closures (cul-de-sacs), diverters, education, forced turn lanes, roundabouts, speed humps, etc.

Reduction Methodology & Source⁴⁵

SMAQMD appears to have the best information available as reflected in their Guidance for Land Use Emission Reductions, which allocates reductions by the percent of intersections with traffic calming improvements as indicated in the table below. We were unable to locate more specific information. Source: Draft Update to SMAQMD Guidance for Land Use Emission Reductions.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is between 0.25% and 1.0%. (See Table in Appendix J)

⁴⁵ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

PARKING MEASURES

10. Paid Parking - Commercial, Mixed-Use, Residential

10.1 Paid Parking: Urban Site within ¼ mile from transit stop-

Measure Description

Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.

Reduction Methodology & Source⁴⁶

Shoupe, 2005. Parking Cash Out. [\$5/day reduces drive-alone share by 21% for commuters to downtown LA, with elasticity of -0.18 (e.g., if price increases 10%, then solo driving goes down by 1.8% more (Wilson 1991)) [Reported 1-10% reduction in trips to central city sites, and 2-4% in suburban sites (Urban Institute)]. The District has used a conservative number for this approach.



Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 5.0%.

10.2 Paid Parking: Urban Site greater than ¼ mile from transit stop-

Measure Description

Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.

⁴⁶ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

Reduction Methodology & Source⁴⁷

Shoupe, 2005. Parking Cash Out. [\$5/day reduces drive-alone share by 21% for commuters to downtown LA, with elasticity of -0.18 (e.g., if price increases 10%, then solo driving goes down by 1.8% more (Wilson 1991)) [Reported 1-10% reduction in trips to central city sites, and 2-4% in suburban sites (Urban Institute)]. The District has used a conservative number for this approach.

Achieved GHG Emission Reductions

With this measure the estimated GHG achieved emission reduction is 1.5%.

10.3 Paid Parking: Suburban site within 1/4 mile of transit stop

Measure Description

Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.

Reduction Methodology & Source⁴⁸

Shoupe, 2005. Parking Cash Out. [\$5/day reduces drive-alone share by 21% for commuters to downtown LA, with elasticity of -0.18 (e.g., if price increases 10%, then solo driving goes down by 1.8% more (Wilson 1991)) [Reported 1-10% reduction in trips to central city sites, and 2-4% in suburban sites (Urban Institute)]. The District has used a conservative number for this approach.

Achieved GHG Emission Reductions

With this measure the estimated GHG achieved emission reduction is 2.0%.

10.4 Paid Parking: Suburban site greater than 1/4 mile from transit stop

Measure Description

Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.

⁴⁷ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

⁴⁸ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

Reduction Methodology & Source⁴⁹

Shoupe, 2005. Parking Cash Out. [\$5/day reduces drive-alone share by 21% for commuters to downtown LA, with elasticity of -0.18 (e.g., if price increases 10%, then solo driving goes down by 1.8% more (Wilson 1991)) [Reported 1-10% reduction in trips to central city sites, and 2-4% in suburban sites (Urban Institute)]. The District has used a conservative number for this approach.

Achieved GHG Emission Reductions

With this measure the estimated GHG achieved emission reduction is 1.0%.

11. Parking Cash Out Measure - Commercial, Mixed-Use

Measure Description

Employer provides employees with a choice of forgoing subsidized parking for a cash payment equivalent to the cost of the parking space to the employer.

Reduction Methodology & Source⁵⁰

Shoupe, 2005. Parking Cash Out. [2/3 as effective as charging for parking (8 case studies - chapter 4, 13% reduction in solo driver trips, -12% VMT per employee, and -11% in vehicle trips per commuter)]. The District has used a conservative number for this approach.

Achieved GHG Emission Reductions

With this measure the estimated GHG achieved emission reduction is 0.6%.

12. Minimum Parking - Commercial, Mixed-Use, Residential

Measure Description

Provide minimum amount of parking required. Special review of parking required. If zoning codes in the San Joaquin Valley area have provisions that allow a project to build less than the typically mandated amount of parking if the development features design elements that reduce the need for automobile use. This measure recognizes the air quality benefit that results when facilities minimize parking needs, and grants mitigation value to project that implement all available parking reductions. Once land uses are determined, the trip reduction

⁴⁹ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

⁵⁰ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

factor associated with this measure can be determined by utilizing the Institute of Transportation Engineers (ITE) Parking generation publication⁵¹. The reduction in trips can be computed as shown below by the ratio of the difference of minimum parking required by code and ITE peak parking demand to ITE peak parking demand for the land uses multiplied by 50%. The maximum achievable trip reduction is 6%. For projects where retail space occupies 50% or more of the total built space, do not use December specific parking generation rates (from ITE). Percent Trip Reduction = $50 * [(min \text{ parking required by code} - ITE \text{ peak parking demand}) / (ITE \text{ peak parking demand})]$.

Reduction Methodology & Source⁵²

Nelson/Nygaard, 2005. pg. 16. (trip reduction = ((actual parking provision - ITE parking generation rate) / ITE parking generation rate) * 0.5). (Note: this formula is not verbatim from that cited in the Nelson/Nygaard document, since the formula provided did not make sense for computing trip reductions. This is what EDAW believes was meant, and this method actually works.) The allowed reduction is the range mid-point.

Achieved GHG Emission Reductions

With this measure the estimated GHG achieved emission reduction is 3.0%.

13. Parking Reduction Beyond Code Measure - Commercial, Mixed-Use, Residential

Measure Description

Provide parking reduction less than code. Special review of parking required. Recommend a Shared Parking strategy. Trip reductions associated with parking reductions beyond code shall be computed in the same manner as described under measure 11, as the same methodology applies. The maximum achievable trip reduction is 12%. This measure can be readily implemented through a Shared Parking strategy, wherein parking is utilized jointly among different land uses, buildings, and facilities in an area that experience peak parking needs at different times of day and day of the week. For example, residential uses and/or restaurant/retail uses, which experience peak parking demand during the evening/night and on the weekends, arrange to share parking facilities with office and/or educational uses, which experience peak demand during business hours and during the week.

⁵¹ The ITE Parking Generation Manual (3rd Edition) is available at: <http://www.ite.org/tripgen/parking.asp>. The ISBN number for this publication is 0-935403-79-5.

⁵² *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007*. Sacramento Metropolitan Air Quality Management District.

Reduction Methodology & Source⁵³

Nelson/Nygaard, 2005. pg. 16. (trip reduction = ((actual parking provision - ITE parking generation rate) / ITE parking generation rate) *0.5). (Note: this formula is not verbatim from that cited in the Nelson/Nygaard document, since the formula provided did not make sense for computing trip reductions. This is what EDAW believes was meant, and this method actually works.) The allowed reduction is the range mid-point. Trip reduction

Achieved GHG Emission Reductions

With this measure the estimated GHG achieved emission reduction is 6.0%.

14. Pedestrian Pathway through Parking Measure - Commercial, Mixed-Use, Residential

Measure Description

Provide a parking lot design that includes clearly marked and shaded pedestrian pathways between transit facilities and building entrances. Pathway must connect to all transit facilities internal or adjacent to project site. Site plan should demonstrate how the pathways are clearly marked, shaded, and are placed between transit facilities and building entrances.

Reduction Methodology & Source⁵⁴

The CCAP guidebook attributes between 1% and 4% reduction from all pedestrian measures. There is no specific information related to providing shaded pedestrian pathways between transit facilities and building entrances. It could be said that providing covered carpool/vanpool spaces near the entrance to the buildings has the similar goal of increasing the comfort of the user while walking to the building entrance. The TIAX report assigns a 1% reduction to the covered carpool measure. Transit usage is most affected by the headway times and the proximity to the destination. Therefore, it would seem reasonable to assume .5%. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by Tax on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated GHG achieved emission reduction is 0.5%.

⁵³ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

⁵⁴ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

15. Off Street Parking Measure - Commercial, Mixed-Use, Residential

Measure Description

For 1.5% reduction, parking facilities shall not be sited adjacent to public roads contiguous with project site. Functioning pedestrian entrances to major site uses are located along street frontage. Parking facilities do not restrict pedestrian, bicycle, or transit access from adjoining uses. Proponent shall provide information demonstrating compliance with measure requirements including, but not limited to, a description of where parking is located relative to the buildings on the site, site plans, maps, or other graphics, which demonstrate the placement of parking facilities behind on-site buildings relative to streets contiguous with the project site. Surrounding uses should be high density or mixed-use, there shall be other adjoining pedestrian and bicycle connections, such as wide sidewalks and bike lanes, and surrounding uses shall also implement measure 15.

For 1.0% reduction, (parking structures only) proponent must show that parking facilities that face street frontage feature ground floor retail along street frontage. Proponent shall provide information demonstrating compliance with measure requirements including, but not limited to, a written description of the parking facility and the amount of retail space on the ground floor, site plans, maps, or other graphics demonstrating the placement of retail/commercial space along all street fronts contiguous with parking structure.

For 0.1% reduction, the project is not among high-density or mixed uses, is not connected to pedestrian or bicycle access ways, or is among uses that do not also hide parking. This point value is reflective of the importance that other pedestrian and density measures be in place in order for this measure to be effective.

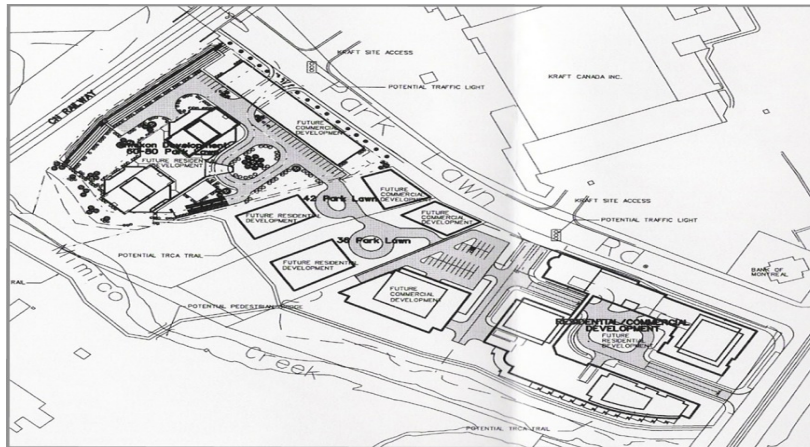
Reduction Methodology & Source⁵⁵

No empirical support for this specific measure; however, range of values is based on other pedestrian-oriented measures. The range recognizes the dependence of this measure on other measures. To be awarded 1.0 points, development must be in an area with density, wide sidewalks, and where other uses are also hiding parking. The efficacy of this measure is reduced to 0.1 if the development does not include other pedestrian and mixed-use measures. Parking structure with ground-floor retail is awarded 0.5.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is between 0.1% and 1.5%.

⁵⁵ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.



16. Office/Mixed-Use Proximate to Transit Measure - *Commercial, Mixed-Use*

Measure Description

Mitigation value is based on project density and proximity to transit. Planned transit must be in MTP or RT Master Plan. To count as "existing transit" service must be fully operational prior to the first 20% of the projects occupancy permits being granted. Project must provide safe and convenient pedestrian and bicycle access to all transit stops within 1/4 mile. Proponent shall provide information demonstrating compliance with measure requirements including, but not limited to, a written description of how the project complies with the measure, a map or graphic depicting the location of the project in relation to the transit stop. Graphic should demonstrate a 1/4 mile radius, arc, from transit and planned pathways and linkages to the transit stop. Proponent shall also provide graphics depicting the size and layout of the building as well as the calculations demonstrating the FAR (floor to area ratio).

Reduction Methodology & Source⁵⁶

No empirical support for this measure, beyond that provided by SMAQMD in its draft guidance. According to Nelson/Nygaard, 2005, trip generation at the non-residential end is influenced by density to a much lesser degree, so this is fairly consistent with the transit reductions applied in measure 20. Assumes a 30 minute transit schedule.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is between 0.2% and 1.5%.

17. Orientation toward “existing” transit, bikeway, or pedestrian corridor - Commercial, Mixed- Use, Residential

Measure Description

Project is oriented towards existing transit, bicycle, or pedestrian corridor. Setback distance is minimized. Setback distance between project and adjacent uses is reduced to the minimum allowed under jurisdiction code. Setback distance between different buildings on project site is reduced to the minimum allowed under jurisdiction code. Setbacks between project buildings and sidewalks is reduced to the minimum allowed under jurisdiction code. Buildings are oriented towards street frontage. Primary entrances to buildings are located along public street frontage. Project provides bicycle access to existing bicycle corridor. Project provides access to existing pedestrian corridor. (Cannot get points for both this measure and measure 17).

Reduction Methodology & Source⁵⁷

The CCAP guidebook attributes a 0.5% reduction per 1% improvement in transit frequency. Based on a case study presented in the CCAP report, a 10% increase in transit rider ship would result in a 0.5% reduction. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by Tax on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.50%.

⁵⁶ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

⁵⁷ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

18. Orientation toward “planned” transit, bikeway, or pedestrian corridor - Commercial, Mixed-Use

Measure Description

Project is oriented towards planned transit, bicycle, or pedestrian corridor. Setback distance is minimized. Planned transit, bicycle or pedestrian corridor must be in the MTP, RT Master Plan, General Plan, or Community Plan. Setback distance between project and existing or planned adjacent uses is minimized or non-existent. Setback distance between different buildings on project site is minimized. Setbacks between project buildings and planned or existing sidewalks are minimized. Buildings are oriented towards existing or planned street frontage. Primary entrances to buildings are located along planned or existing public street frontage. Project provides bicycle access to any planned bicycle corridor(s). Project provides pedestrian access to any planned pedestrian corridor(s).

Reduction Methodology & Source⁵⁸

The CCAP guidebook attributes a 0.5 % reduction per 1% improvement in transit frequency. Based on a case study presented in the CCAP report, a 10% increase in transit rider ship would result in a 0.5% reduction. Source: CCAP Transportation Emission Guidebook; TIAX Results of 2005 Literature Search Conducted by Tax on behalf of SMAQMD.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.25%.

19. Residential Density Measure - Residential

Measure Description

Residential Density with “no transit”, project provides high-density residential development. Mitigation value is based on project density with no transit. Density is calculated by determining the number of units per acre (“du/acre”) within the residential portion of the project's net lot area.

Residential Density with “planned” light rail transit, project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre (“du/acre”) within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project

⁵⁸ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.

Residential Density with “planned” bus rapid transit, project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.

Residential Density with “existing” light rail transit, project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.

Residential Density with “existing” bus rapid transit, project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.

Reduction Methodology & Source⁵⁹

Nelson/Nygaard, 2005. pg 11. (trip reduction = $0.6 * (1 - (19749 * ((4.814 + \text{households per residential acre}) / (4.814 + 7.14))^{-.639}) / 25914)$) (Holtzclaw et al 2002). Asymptote of 60% reduction. **Relative to a 3 du/ac development.** Note that there is no direct empirical support for the added reductions for proximity to transit; the 60% asymptote in this equation is to correct for double-counting from transit services, mix-of-uses, and bicycle and pedestrian connections (which could contribute another 40% reduction).

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is: See Table in Appendix J.

⁵⁹ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

20. Street Grid Measure - Commercial, Mixed-Use, Residential

Measure Description

Multiple and direct street routing (grid style). The measure applies to projects with an internal connectivity factor (CF) \geq 0.80, and average of 1/4 mile or less between external connections along perimeter of project. [CF=# of intersections / (# of cul-de-sacs + intersections)].

Reduction Methodology & Source⁶⁰

Reductions are based on CCAP estimates for similar measures. Source: CCAP Transportation Emission Guidebook.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 1.0%.

21. Neighborhood Electric Vehicle Access - Commercial, Mixed-Use, Residential

Measure Description

Make physical development consistent with requirements for neighborhood electric vehicles (NEV). Current studies show that for most trips, NEVs do not replace gas, fueled vehicles as the primary vehicle. For the purpose of providing incentives for developers to promote NEV use, assume the percent reductions noted below.

For 1.5% reduction, a neighborhood shall have internal NEV connections and connections to other existing NEV networks serving all other types of uses.

For 1.0% reduction, a neighborhood shall have internal and external connections to surrounding neighborhoods.

For 0.5% reduction, a neighborhood has internal connections only.

Reduction Methodology & Source⁶¹

No direct empirical support for this measure available. May not be relevant/applicable in the near term, until NEVs become more common/inexpensive. Current studies show that for most trips, NEVs do not

⁶⁰ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

⁶¹ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

replace gas-fueled vehicles as the primary vehicle. For the purposes of providing incentives for developers to promote NEV use, assume that a neighborhood with internal NEV connections only receives 0.5 points, with external connections to other surrounding uses, 1.0 point, with external connections to other NEV networks, 1.5 points.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is between 0.5% and 1.5%.

22. Affordable Housing Component Measure - Residential

Measure Description

Residential development projects of 5 or more dwelling units provide a deed-restricted low-income housing component on-site (as defined in Ch 22.35 of Sacramento County Ordinance Code) [Developers who pay into In-Lieu Fee Programs are not considered eligible to receive credit for this measure]. Percent reductions shall be calculated according to the following formula: % reduction=% units deed-restricted below the market rate housing *0.04. The table in Appendix J illustrates sample percent reductions for the percentage of units that are deed restricted below the market housing rate. If the percentage is not listed on the table, the calculation must be done using the equation provided in the methodology.

Reduction Methodology & Source⁶²

Nelson/Nygaard, 2005. pg. 15. (trip reduction = % units deed-restricted below market rate housing * 0.04).

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is between 0.6% and 4.0%.

⁶² Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

MIXED-USE MEASURES

23. Urban Mixed-Use Measure - Mixed Use

Measure Description

Development of projects predominantly characterized by properties on which various uses, such as office, commercial, institutional, and residential are combined in a single building or on a single site in an integrated development project with functional inter-relationships and a coherent physical design. Mitigation points for this measure depend on job to housing ratio.



Reduction Methodology & Source⁶³

Nelson/Nygaard, 2005. pg. 12. (trip reduction = $(1 - (\text{ABS}(1.5 \cdot h - e) / (1.5 \cdot h + e)) - 0.25) / 0.25 \cdot 0.03$) where h = study area housing units, e = study area employment (Criterion & Fehr & Peers, 2001). Asymptote of 9% reduction, and an ideal 1.5 jobs per household. Note, these point reductions were taken from Urbemis 2007 9.2.4⁶⁴ data according to sample jobs to housing ratio. Cannot get credit for both this measure and the following measures: Suburban Mixed-Use and Other Mixed-Use.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is between 3.0% and 9.0%.

24. Suburban Mixed-Use Measure - Commercial, Mixed-Use, Residential

Measure Description

Have at least three of the following on site and/or offsite within ¼ mile: Residential Development, Retail Development, Park, Open Space, or Office.

⁶³ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

⁶⁴ Urbemis 2007 Version 9.2.4. Rimpo and Associates.

Reduction Methodology & Source⁶⁵

By definition, this type of land use implies that housing availability is greater than employment availability. On a project-by-project basis, use formula :Nelson/Nygaard, 2005. pg. 12. (trip reduction = $(1 - (\text{ABS}(1.5 \cdot h - e) / (1.5 \cdot h + e)) - 0.25) / 0.25 \cdot 0.03$) where h = study area housing units, e = study area employment (Criterion & Fehr & Peers, 2001) to obtain higher than 3% reduction. Otherwise, assume 3% max reduction. Cannot get credit for this measure and the following measures: Other Mixed-Use and Urban Mixed-Use measures.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 3.0%.

25. Other Mixed-Use Measure - Mixed-Use, Residential

Measure Description

All residential units are within ¼ mile of parks, schools or other civic uses. Civic uses are government facilities that provide services directly to the public (post office, city hall, courthouse, community center, etc.).

Reduction Methodology & Source⁶⁶

This measure has less to do with employment/housing balance. No empirical support for this measure, but logic from suburban mixed-use measure applies. Can't get credit for both this measure and the following measures: Urban Mixed-Use and Suburban Mixed-Use Measures.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 1.0%.

⁶⁵ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

⁶⁶ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

BUILDING COMPONENT MEASURES

26. Energy Star Roof Measure - Commercial, Mixed-Use, Residential

Measure Description

Install Energy Star labeled roof materials. Energy star qualified roof products reflect more of the sun's rays, decreasing the amount of heat transferred into a building.

Reduction Methodology & Source⁶⁷

Reductions are based on the credits documented in the SMAQMD Guidance for Land Use Reductions and consistent with the point rating now set at 0.5 for qualified roof products. Baseline conditions assume indirect emission reduction through more even temperature control of environmental space. Approach is enforceable and may be monitored through site review and/or consultation with lead agency that roofing materials match those described in the SMAQMD Guidance for Land Use Reductions. The District has used a conservative number for this approach.



Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.5%.

27. Onsite Renewable Energy System Measure - Commercial, Mixed-Use, Residential

Measure Description

Projects that install renewable energy systems capable of generating 2.5%-12.5% of project's annual energy need shall receive 1.0 mitigation points.

⁶⁷ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

Reduction Methodology & Source⁶⁸

Reductions are based on the Energy & Atmosphere credits (EA Credit 2) documented in the Leadership in Energy & Environmental Design (LEED), Green Building Rating System for New Constructions and Major Renovations, Version 2.2, October 2005. The reduction assumes that at least 12.5% of the buildings total energy use (as expressed as a fraction of annual energy cost) is supplied through the use of on-site renewable energy systems. Alternatively a project may use the Department of Energy (DOE) Commercial Buildings Energy Consumption Survey (CBECS) database to determine the estimated electricity use. Non-polluting and renewable energy potential includes solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, projects may take advantage of net metering with the local utility. The measure is enforceable through LEED Letter certification and building design calculations demonstrating that at least 12.5% of total energy costs are supplied by the renewable energy system(s). The District has used a conservative number of 1.0 for projects that install renewable energy systems capable of generating 2.5%-12.5% of project's annual energy need.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 1.0%.

28. Exceed Title 24 Measure - Commercial, Mixed-Use, Residential

Measure Description

Project Exceeds Title 24 requirements by 20%.

Reduction Methodology & Source⁶⁹

Reductions assume at least a 20% over Title 24 requirements, as calculated by the Sacramento Municipal Utility District (SMUD, 2006 Advantage Home Program Overview). The proposed point value for this operational mitigation measure is 1.0, consistent with the rating assigned to this measure by SMAQMD Land Use Mitigation Measures. Total compliance margin is based on energy savings relative to the total energy budget and cooling energy budget of the Title 24 Standard design home. Proponent shall provide information demonstrating compliance with measure requirements including, but not limited to, specifications and any available manufacturer's documentation on the devices to be used. This measure's successful implementation may be verified by a site review following

⁶⁸ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

⁶⁹ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

construction to confirm that the project as built contains ozone destruction catalysts as described in the Air Quality Plan.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 1.0%.

29. Solar Orientation Measure - Residential

Measure Description

Orient 75 or more percent of homes and/or buildings to face either north or south (within 30 degrees of North or South). Building design includes roof overhangs that are sufficient to block the high summer sun, but not the lower winter sun, from penetrating south facing windows. Trees, other landscaping features and other buildings are sited in such a way as to maximize shade in the summer and maximize solar access to walls and windows in the winter.

Reduction Methodology & Source⁷⁰

Reduction assumes that proper solar orientation can produce a total energy savings of 11% to 16.5% and reduce heating fuel consumption by up to 25% (Local Government Commission, 1998). Mitigation measure points are based on the credits documented in the SMAQMD Guidance for Land Use Reductions and consistent with the point rating now set at 0.5 for proper orientation. Reduction methodology will be based on quantification of the difference in solar radiance from development with designed orientations (75 or more percent of homes and/or buildings to face within 30 degrees either north or south) compared to evenly distributed orientations. Project compliance will be based on the percentage of orientation buildings designed with proper design features (overhangs, landscaping).

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.5%.

⁷⁰ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

30. Non Roof Surfaces Measure - Commercial, Mixed-Use Residential

Measure Description

Provide shade (within 5 years) and/or use light-colored/high-albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30% of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.; OR place a minimum of 50% of parking spaces underground or covered by structured parking; OR use an open-grid pavement system (less than 50% impervious) for a minimum of 50% of the parking lot area. Unshaded parking lot areas, driveways, fire lanes, and other paved areas have a minimum albedo of .3 or greater.

Reduction Methodology & Source⁷¹

Reductions are based on the Sustainable Site credits (SS Credit 7.1) documented in the Leadership in Energy & Environmental Design (LEED), Green Building Rating System for New Constructions and Major Renovations, Version 2.2, October 2005. The reduction assumes that the project provides any combination of the following strategies for 50% of the site landscape (including roads, sidewalks, courtyards and parking lots): Shade (within 5 years of occupancy); paving materials with a solar Reflectance Index (SRI) of at least 29; open grid pavement system.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 1.0%.

31. Green Roof Measure - Commercial, Mixed-Use, Residential

Measure Description

Install a vegetated roof that covers at least 50% of roof area. Project should demonstrate detailed graphics depicting the planned roof, detailed information on maintenance requirements for the roof, and the facilities plan for maintaining the roof post construction.

Reduction Methodology & Source⁷²

Reductions are based on the Energy & Atmosphere credits (EA Credit 2) documented in the Leadership in Energy & Environmental Design (LEED), Green

⁷¹ *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

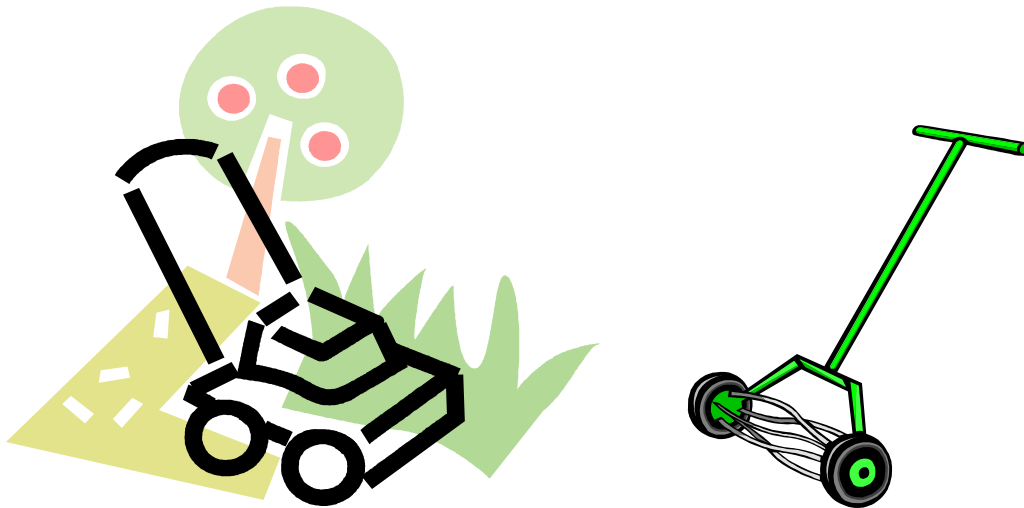
⁷² *Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007.* Sacramento Metropolitan Air Quality Management District.

Building Rating System for New Constructions and Major Renovations, Version 2.2, October 2005. The reduction assumes that a vegetated roof is installed on a least 50% of the roof area or that a combination high albedo and vegetated roof surface is installed that meets the following standard: $(\text{Area of SRI Roof}/0.75) + (\text{Area of vegetated roof}/0.5) \geq \text{Total Roof Area}$.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 0.5%.

TDM & MISC. MEASURES



33. Electric Lawnmower Measure - Residential

Measure Description

Provide a complimentary electric lawnmower to each residential buyer.

Reduction Methodology & Source⁷³

Reduction is based on a 0.5% reduction in total air shed VOC emissions, as attributable to the Lawn Mower Buy-Back program (Portland, Oregon, ten-year ozone maintenance plan). Mitigation measure points are based on the credits documented in the SMAQMD Guidance for Land Use Reductions and consistent with the point rating now set at 1.0 for electric lawnmowers. Approach is enforceable and may be monitored through site review and/or consultation with lead agency that roofing materials match those described in the SMAQMD Guidance for Land Use Reductions.

Achieved GHG Emission Reductions

With this measure the estimated achieved GHG emission reduction is 1.0%.

⁷³ Recommended Guidance for Land Use Emission Reductions, Version 2.4, August 2007. Sacramento Metropolitan Air Quality Management District.

ADDITIONAL PERFORMANCE STANDARDS REQUIRING FURTHER INVESTIGATION



In addition to those GHG emission reduction measures identified above, the District recognizes there are other potential mitigation measures that can be incorporated into the list but would need further evaluation. In relation, those identifiable measures have been incorporated in the Table in Appendix J.

In parallel, CAPCOA has developed a list of mitigation measures compiled from a number of sources (e.g., CAPCOA White Paper, AG's website, & several air agencies). CAPCOA evaluated the list to

eliminate redundancy and rank according to importance or potential GHG control efficiencies. A consultant will be assisting CAPCOA in performing literature search to identify a methodology for quantifying GHG mitigation measure control efficiencies for CO₂, CH₄, and N₂O, and quantifying the control efficiencies. The District participates in this work and will continue to follow it closely as well as other similar types of effort.

SAMPLE ISR PROJECTS

From projects that have complied with Indirect Source Review (ISR), the District has randomly selected three projects to see how they compare to the GHG emission reduction measures proposed by the District to reduce greenhouse gas emissions.

- Sample project 1: Mixed-use development including: 209,650 square feet of commercial space, 278,200 square feet of office space, and 24 dwelling units. The total achieved CO₂ mitigation points achieved for this project was 20.4.
- Sample project 2: Residential development including: 205 single family residential dwelling units. The total achieved CO₂ mitigation points achieved for this project was 11.6.
- Sample project 3: Commercial development including: 59,909 square feet of commercial space. The total achieved CO₂ mitigation points achieved for this project was 14.7.

Based on these samples, the District believes that it will be difficult, but feasible, for development projects to achieve the 29% reduction. However, it would require further mitigation by project proponents than that which is typically being proposed for today's projects.

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19. SJVAPCD- CEQA GHG Guidance Level of Significance Subcommittee (February 18, 2009)
20. SJVAPCD- CEQA GHG Guidance Mitigation Measures Subcommittee (March 04, 2009)

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Appendix A:

Project Scope Committee Members

Project Scope- List of Ad Hoc Committee Members

Name	Affiliation
Daniel Barber	San Joaquin Valley Air Pollution Control District
J.P Cativiela	Dairy CARES
Dennis J. Champion	Occidental of Elk Hills
Casey Creamer	California Cotton Ginners
Tin Cheung	The Planning Center
Dawn S. Chianese	Environ
Kevin Clutter	Conestoga-Rovers & Associates (CRA)
Jerry Frost	Kern Oil
Wendy Garcia	Constellation Wines
Sarah Jackson	EarthJustice
Julia Lester	Environ
Arnaud Marjollet	San Joaquin Valley Air Pollution Control District
Mark Montelongo	San Joaquin Valley Air Pollution Control District
Elena Nuno	Michael Brandman Associates
Dennis Roberts	San Joaquin Valley Air Pollution Control District
Patia Siong	San Joaquin Valley Air Pollution Control District
Dennis Tristao	J.G. Boswell Company
Tom Umenhofer	Western States Petroleum Association
Nicole Vermilion	The Planning Center

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Appendix B:

Level of Significance Committee Members

Level of Significance- Ad hoc Subcommittee Members:

Name	Affiliation
Bettina Arrigoni	Global Energy Partners, LLC
Dan Barber	SJVAPCD
John Beckman	Building Industry Assoc. of the Delta
David Campbell	Tricor
Donna Carpenter	Sikand Engineering
Dennis Champion	Occidental of Elk Hills
Dawn S. Chianese	Environ
Tin Cheung	The Planning Center
Casey Creamer	California Cotton Ginners
Caroline Farrell	Center on Race, Poverty & Environment
Jerry Frost	Kern Oil
Wendy Garcia	Constellation Wines
Issac A. George	City of Arvin
Spencer Hammond	Chevron
Erin Burg Hupp	Attorney at Law-Meyers Nave
Sarah Jackson	Earth Justice
Bob Keenan	HBATK
Julia Lester	Environ
John Ludwick	Berry Petroleum Company
Arnaud Marjollet	SJVAPCD
Michael B. McCormick	PMC
Mark Montelongo	SJVAPCD
Gordon Nipp	Kern-Kaweah Chapter of Sierra Club
Elena Nuno	Michael Brandman Assoc.
Tonya Short	HBA of Kern County
Patia Siong	SJVAPCD
David Smith	DMD Associates
Lee Smith	Attorney-Stoel Rives
Dennis Tristao	J.G. Boswell Company
Tom Umenhofer	Western States Petroleum Association
Lisa Van de Water	SJVAPCD
Nicole Vermilion	The Planning Center

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Appendix C:

Mitigation Measures Committee Members

Mitigation Measures- Ad hoc Subcommittee Members:

Name	Affiliation
Bettina Arrigoni	Global Energy Partners, LLC
Dan Barber	SJVAPCD
John Beckman	Building Industry Assoc. of the Delta
David Campbell	Tricor
Donna Carpenter	Sikand Engineering
Dennis Champion	Occidental of Elk Hills
Dawn S. Chianese	Environ
Tin Cheung	The Planning Center
Casey Creamer	California Cotton Ginners
Caroline Farrell	Center on Race, Poverty & Environment
Jerry Frost	Kern Oil
Wendy Garcia	Constellation Wines
Issac A. George	City of Arvin
Spencer Hammond	Chevron
Erin Burg Hupp	Attorney at Law-Meyers Nave
Sarah Jackson	Earth Justice
Bob Keenan	HBATK
Julia Lester	Environ
John Ludwick	Berry Petroleum Company
Arnaud Marjollet	SJVAPCD
Michael B. McCormick	PMC
Mark Montelongo	SJVAPCD
James P. Mosher	CO ₂ & Energy
Gordon Nipp	Kern-Kaweah Chapter of Sierra Club
Elena Nuno	Michael Brandman Assoc.
Tonya Short	HBA of Kern County
Patia Siong	SJVAPCD
David Smith	DMD Associates
Lee Smith	Attorney-Stoel Rives
Dennis Tristao	J.G. Boswell Company
Tom Umenhofer	Western States Petroleum Association
Lisa Van de Water	SJVAPCD
Nicole Vermilion	The Planning Center

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Appendix D: San Joaquin Valley Greenhouse Gas CEQA Guidance Issue Paper (December 10, 2008)



**San Joaquin Valley
Air Pollution Control District**

**SAN JOAQUIN VALLEY
GREENHOUSE GAS CEQA GUIDANCE
ISSUE PAPER**

December 10, 2008

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CHAPTER 1- INTRODUCTION

The California Legislature enacted CEQA in 1970. CEQA is intended to address a broad range of environmental issues, including water quality, noise, land use, natural resources, transportation, energy, human health, biological species, and air quality. CEQA requires that public agencies (i.e., local, county, regional, and state government) consider and disclose the environmental effects of their decisions to the public and governmental decision makers. Further, it mandates that agencies implement feasible mitigation measures or alternatives that would mitigate significant adverse effects on the environment. CEQA requires public agencies to identify potentially significant effects on the environment of projects they intend to carry out or approve, and to mitigate significant effects whenever it is feasible to do so.

Although AB 32 gives wide responsibility to ARB to regulate GHG emissions from all sources, including non-vehicular sources, it does not preempt or excuse permitting agencies from addressing GHGs under CEQA.

In August 2008 the District's Governing Board adopted the Climate Change Action Plan (CCAP). The CCAP authorized the Air Pollution Control officer to develop guidance documents to assist land use agencies address greenhouse gas (GHG) emissions as part of the California Environmental Quality Act (CEQA) process, develop a greenhouse gas banking program, enhance the existing emissions inventory process to include greenhouse gas emissions, and administer voluntary greenhouse gas emission reduction agreements. These items would then be brought before the Governing Board for their consideration.

This white paper focuses solely on various issues concerning the development of District guidance for addressing project related greenhouse emissions during the CEQA process. This paper does not address the other items called for in the CCAP. Information on climate change and governmental activities in California to reduce GHG emissions are presented in the District's Climate Change Action Plan Staff Report.

The intent of this white paper is to provide a starting point for developing guidance for addressing GHG emissions during the CEQA process. There are many potentially valid concepts, each with its own benefits and disadvantages that will be evaluated by the GHG CEQA Guidance Technical Workgroup.

The goals of the GHG CEQA guidance are to provide a mechanism:

- to identify the scope of GHG emissions related to specific projects,
- quantify those GHG emissions,
- identify GHG emissions mitigation measures, and
- to assess the significance of project related GHG emissions.

CHAPTER 2 SCOPE OF PROJECT GHG EMISSIONS

Per CEQA Guidelines Section 15378, “Project” means the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and that is any of the following:

- (1) An activity directly undertaken by any public agency including but not limited to public works construction and related activities clearing or grading of land, improvements to existing public structures, enactment and amendment of zoning ordinances, and the adoption and amendment of local General Plans or elements thereof pursuant to Government Code Sections 65100-65700.
- (2) An activity undertaken by a person which is supported in whole or in part through public agency contracts, grants, subsidies, loans, or other forms of assistance from one or more public agencies.
- (3) An activity involving the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies

For the purpose of this GHG CEQA guidance, a key issue to be resolved is what emissions should be attributed to a project?

Project related GHG emissions could consist of:

- Direct project GHG operational emissions:
 - o Combustion emissions,
 - o Methane generation, etc
- Ancillary project GHG operational emissions:
 - o Power consumption to operate project equipment
 - o Power consumption to operate peripheral equipment
- Indirect project GHG emissions:
 - o Operational mobile sources emissions
 - Delivery vehicles - raw material
 - Shipping vehicles - finished goods
 - o Project life cycle emissions
 - Emissions generated during the entire life cycle of the project: ranging from mining of raw materials, processing those materials into steel, manufacturing of equipment, to shipment and installation of equipment at the project site, etc.

CHAPTER 3 QUANTIFICATION OF PROJECT GHG EMISSIONS

Protocols for quantifying GHG emissions:

- Translating project activities into GHG emissions
- Emission factors associated with each activity

For example, determining GHG emission from electricity consumption associated with the operation of the project equipment would require consideration of the following:

- Energy consumption (e.g. kwh used)
- Source of electricity (e.g. fossil fuel combustion, hydroelectric, solar, etc)
- Energy production characterization (fossil fuel: coal, natural gas, oil, etc)
- Energy production source %
- Emission factors
- Etc

For example, determining GHG emission from mobile sources (raw materials delivery trucks) associated with the project would require consideration of the following:

- Size of truck
- Truck engine tier
- Truck engine horse power
- Vehicle Miles Traveled (VMT)
- % of VMT attributed to the specific project operation
- Fuel type
- Emission factors
- Etc

For example, determining GHG emission from mobile sources (worker commute) associated with the project would require consideration of the following:

- Number of workers
- Number of vehicles
- Type of vehicles
- Carpooling parameters
- Vehicle Miles Traveled (VMT)
- % of VMT attributed to the specific operation
- Fuel type
- Emission factors
- Etc

CHAPTER 4 GHG EMISSIONS MITIGATIONS

CEQA Guideline, section 15370, defines mitigations as:

- Avoiding the impact all together by not taking a certain action or parts of an action,
- Minimizing impacts by limiting the degree or magnitude of the actions and its implementation,
- Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment,
- Reducing or eliminating the impact over time by preservation and maintenance operation during he life of the action, or
- Compensating for the impact by replacing or providing substitute resources or environments.

Identifying GHG emission mitigations would require consideration of the following:

- Reference point:
 - o Business As Usual (BAU),
 - o AB32 mandates,
 - o Etc
- Surplus aspect of proposed mitigation compared to any current or future GHG emission reduction requirements:
 - o Identify current and future GHG emission reduction requirements
- Longevity of the GHG emission mitigations:
 - o Life of the GHG emissions reduction projects (e.g. planting trees versus trees decomposition, etc)
 - o GHG emission reduction future requirements
- Quantification GHG emission mitigations:
 - o Type and nature of GHG emissions reduction project
 - o Scope of GHG emissions reduction project (See identification and quantification of project GHG emission sections)
- Voluntary Emission Reduction Agreement
- GHG emission reduction banking system used to mitigate future GHG emissions increases
- Verification and enforceability of the proposed GHG emission mitigations:
 - o Local GHG emissions reduction projects
 - o GHG emissions reduction projects occurring somewhere else on Earth

CHAPTER 5 SIGNIFICANCE OF PROJECT RELATED GHG EMISSIONS

CEQA requires public agencies to identify potentially significant effects on the environment of projects they intend to carry out or approve, and to mitigate significant effects whenever it is feasible to do so. Per CEQA Guidance, section 15382, "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

This determination of significance must be based on the substantial evidence in light of all the information before the agency. At this time there are no generally accepted thresholds of significance for determining the impact of GHG emissions from an individual project on global climatic change.

Under state law, it is the purview of each lead agency to determine what, if any, significance thresholds will be established to guide its review of projects under CEQA. Traditionally, the District has provided local lead agencies technical guidance for assessing a project's potential impact on air quality, including establishment of significance thresholds for criteria pollutants.

Existing and proposed approaches to addressing the significance of GHG emissions during the CEQA process will be discussed and evaluated.

Possible approaches for addressing GHG during the CEQA process:

- Single GHG significance threshold
- Multiple GHG significance thresholds
- Specific project type determination
- Program level CEQA determination
- Facility level CEQA determination
- Performance based threshold
- Tiered classification of projects' impacts
- Combination of any of the above
- Others, to be determined

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Appendix E: CEQA GHG Guidance Project Scope Subcommittee – Characterization of Greenhouse Gas Emissions (February 10, 2009)

CEQA GHG Guidance Project Scope Subcommittee

Characterization of Greenhouse Gas Emissions

February 10, 2009

The District has actively sought input from the ad hoc committee and the following document is still under development. The District is still receiving comments from the committee, which will be considered before finalizing this document.

Ad Hoc Committee Members:

Daniel Barber, J.P. Cativiela, Dennis J. Champion, Casey Creamer, Tin Cheung, Dawn S. Chianese, Kevin Clutter, Jerry Frost, Wendy Garcia, Sarah Jackson, Julia Lester, Arnaud Marjollet, Mark Montelongo, Elena Nuno, Dennis Roberts, Patia Siong, Dennis Tristao, Tom Umenhofer, and Nicole Vermilion.

See appendix A

Introduction

During the Greenhouse Gas (GHG) CEQA Guidance Technical Workgroup meeting an ad hoc committee was formed to evaluate GHG emissions resulting from one industrial and one non-industrial project. Key objectives were to identify and quantify potential direct sources of GHG emissions, to the extent feasible, identify and quantify potential indirect GHG emissions, and to report back to the Technical Workgroup, providing guidance/recommendations regarding the scope of GHG emissions to be considered during the CEQA environmental review process.

Several discussions were coordinated on these key objectives over four conference calls that were held on December 17 and 23, 2008 and on January 6 and 9, 2009. This document summarizes the subcommittee's discussions.

The industrial project selected by the committee consists of adding a 14.6 MMBtu/hr natural gas fired powdered milk spray dryer operation increasing throughput of an existing milk processing facility by 1,200 tons of milk per day. The mixed-use development project consists of 201,000 sq ft commercial, 278,000 sq ft of office space, plus 24 residential units, all situated on 40 acres. Both projects are actual projects submitted to the District. When possible, GHG emissions were calculated using project specific information, otherwise, assumptions were made using best available information.

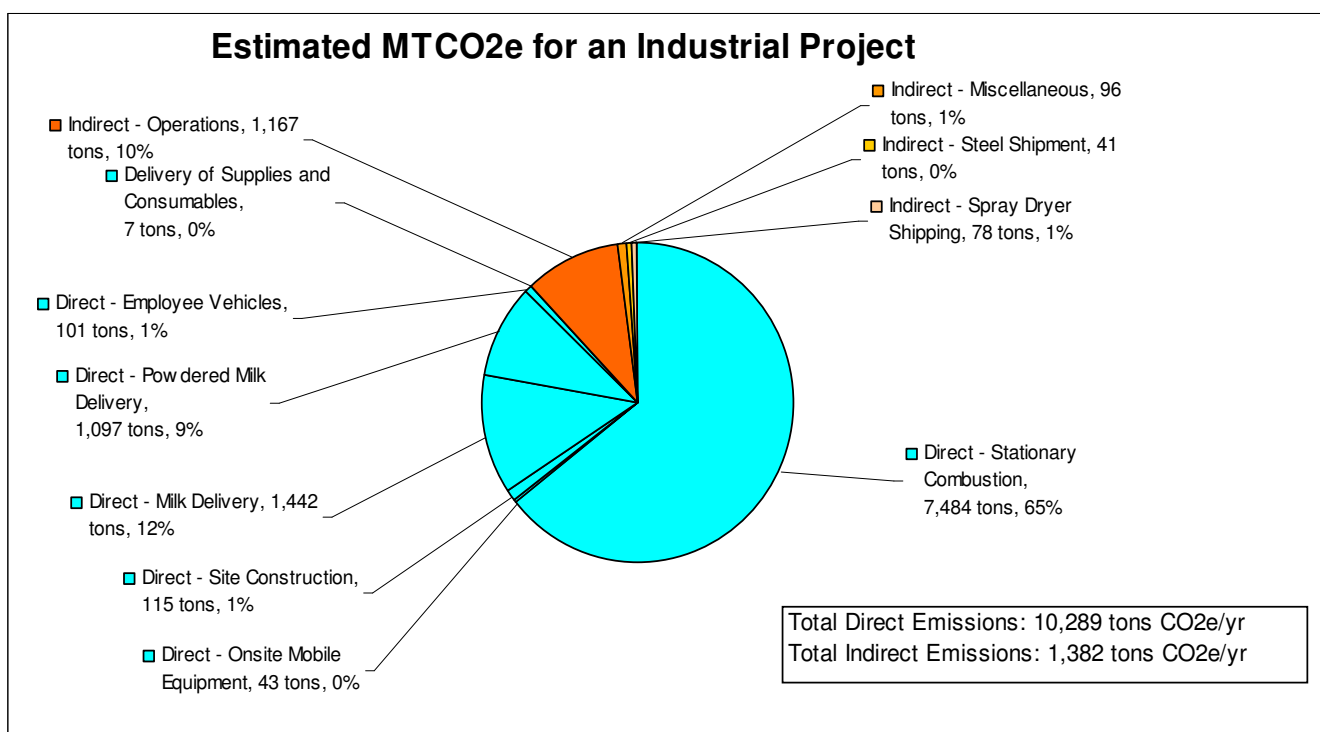
Emission sources were categorized as either Direct, Indirect, or lifecycle. Direct emissions result from a physical change in the environment which is caused by and which is immediately related to the project. Examples of direct emissions are operational emissions (emissions from activities occurring on-site), mobile source emissions (vehicular emissions resulting from delivery of operational materials to the facility, shipment of finished goods, and vehicular emissions resulting from employee, customer, or residential traffic), and emissions from on-site construction activities. Direct emission sources are traditionally considered during the CEQA review process. Indirect emissions result from a physical change in the environment which is not immediately related to the project, but is caused by the project. Examples of indirect emissions include emissions resulting from the generation of electricity to meet project related energy demands. Lifecycle emissions result from a physical change in the environment which is not immediately related to the project, but is caused by a given product or service caused or necessitated by the existence of a project. Examples of lifecycle emissions include emissions from mining, timber harvesting, processing raw materials into intermediate, i.e. converting iron ore into steel, and fabrication of raw materials into finished goods used by a project. Details of emissions sources are presented in attached Table-1 and Table-2.

Industrial Project Emissions – Determinations

The following statistics, also shown in Figure 1, pertain to the industrial project described above:

- Stationary source emissions account for about 70% of direct emissions
- Mobile source emissions account for about 26% of direct emissions
- Construction emissions account for about 1% of direct emissions
- Electrical power consumption account for about 95% of indirect emissions
- Shipment of steel and boiler account for about 5% of indirect emissions
- Total indirect emissions account for about 12% of combined total direct and indirect emissions

Figure 1: Estimated GHG Emissions for an Industrial Project

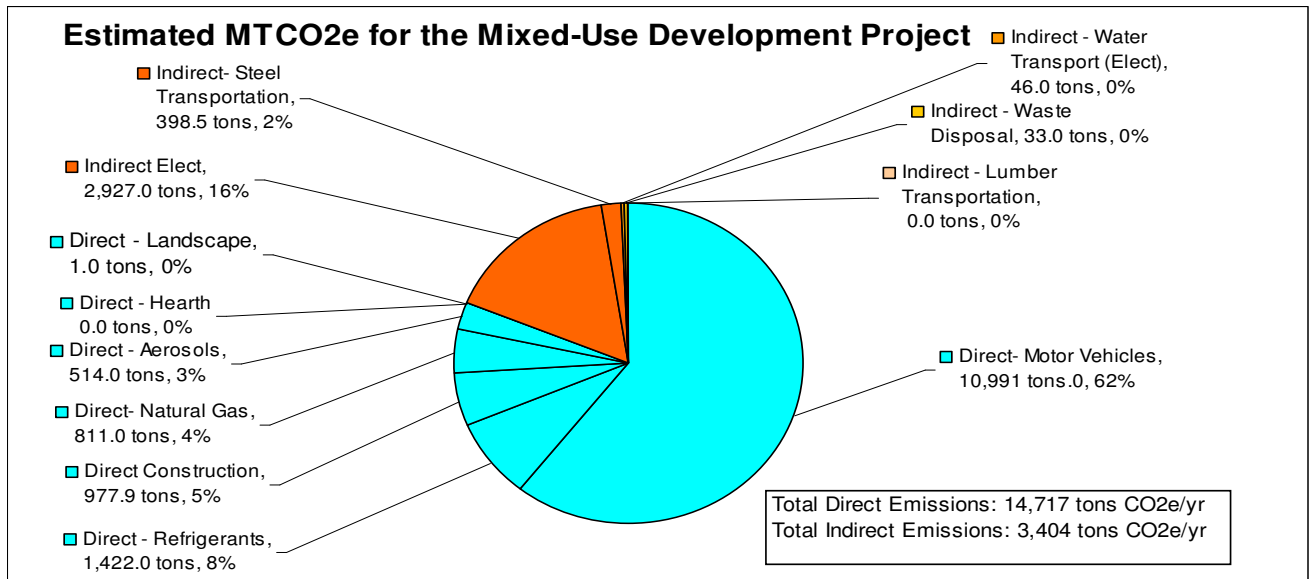


Mixed-Use Project Emissions – Determinations

The following statistics, also shown in Figure 2, pertain to the mixed-use project described above:

- Mobile source emissions account for about 75% of direct emissions
- Refrigerant loss account for about 10% of direct emissions
- Construction emissions account for about 7% of direct emissions
- Natural gas consumption account for about 6% of direct emissions
- Aerosol emissions account for about 4% of direct emissions
- Electrical power consumption account for about 97% of quantifiable indirect emissions
- Total indirect emissions account for about 19% of combined total direct and indirect emissions
- It was not feasible to estimate indirect emissions associated with transportation of raw materials and finished goods

Figure 2: Estimated GHG Emissions for an Mixed- Use Development Project



The assumptions used in the analysis of these two projects can be found in Appendix B and Appendix C.

Indirect Emissions from Electrical Power Consumption - Determinations

The following points represent the committee's majority opinion on this topic:

- For both industrial and non-industrial projects it is feasible to estimate potential electrical consumption and the associated indirect GHG emissions
- Decreasing electrical power consumption would reduce GHG emissions and concomitantly have a positive impact on global climatic change
- Estimating emissions from electrical power consumption is speculative because the actual source of generation (wind, fossil fuel, nuclear, hydroelectric, etc) and location of generation (within or outside California) is unknown
- Traditionally, indirect emissions associated with production of electrical power are not attributed to a development or industrial project
- Emissions resulting from electrical power generation have already been attributed to the power production facility and the power production facility has already been required to mitigate the impacts of its emissions
- Power generating facilities are subject to AB32 emission reduction targets and thus, will be required to mitigate their GHG emissions
- Including indirect emissions associated with electrical power consumption likely double counts GHG emissions associated with electrical power generation. Thus, overstating a project's environmental impacts

Indirect Emissions from Raw Materials and Finished Goods (Lifecycle Emissions) - Determinations

The following points represent the committee's majority opinion on this topic:

- Within limits, it was feasible to estimate potential emissions associated with transportation of raw materials and delivery of finished goods for industrial projects.
- It was not feasible to estimate indirect emissions associated with transportation of raw materials and finished goods for non-industrial projects.
- Estimation of potential emissions associated with transportation of raw materials and delivery of finished goods is highly speculative.
- Knowing emissions resulting from manufacturing and transportation of finished goods could influence decisions on sourcing products and consumer consumption.
- Reducing emissions associated with manufacture and transportation of finished goods would have a positive impact on global climatic change.
- Emissions associated with transportation of raw materials and delivery of finished goods is a minor percentage of direct project emissions.

Greenhouse Gas Reporting Protocols

As a starting point, the committee reviewed two greenhouse gas reporting protocols: (1) the General Reporting Protocol (the Protocol) developed by the California Climate Action Registry, and (2) the Greenhouse Gas Protocol (GHG Protocol) developed by the World Business Council for Sustainable Development and the World Resources Institute.

The Protocol is used primarily by California Registry members in calculating and reporting emissions through the California Action Registry Reporting Online Tool. It provides guidance for businesses, government agencies, and non-profit organizations to participate in the California Climate Action Registry, a voluntary greenhouse gas registry. The Protocol is used to report emissions within California or with the United States.

The GHG Protocol also provides guidance for businesses and other organizations. It consists of two modules: the Corporate Accounting and Reporting Standards and the Project Accounting Protocol Guidelines. The first one contains methodologies for business and others to inventory and report all of the GHG emissions they produce. The latter one is geared toward calculating reductions in GHG emissions from specific GHG-reduction projects. The GHG Protocol states that the GHG assessment boundary is to include all the GHG effect regardless of where they occur and who has control over the sources and sinks associated with them.

The Protocol identifies the operational boundaries through direct emissions and indirect emissions. The GHG Protocol also identifies the emissions as direct or indirect but uses several types of scope of accounting and reporting for indirect emissions.

Methodologies for calculating GHG emission are relevant to calculating project specific GHG emission and were used here. More details on the reporting requirements can be found at <http://www.climateregistry.org/tools/protocols/general-reporting-protocol.html> for the Protocol, and at <http://www.wri.org/project/ghg-protocol> for the GHG Protocol.

Discussion:

Pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15064(d), "in evaluating the significance of the environmental effect of a project, the Lead Agency shall consider direct physical changes in the environment which may be caused by the project and reasonably foreseeable indirect physical changes in the environment which may be caused the by project." The CEQA Guidelines clearly

states that a physical change that is speculative or unlikely to occur is not reasonably foreseeable (CEQA Guidelines Section 15064[d][3]).

While use of raw materials for construction and operation is an indirect consequence of a project, the emissions and potential environmental impacts associated with the production and transportation of raw materials is unknown and estimation of said emissions is highly speculative. The quantification of emissions associated with raw material usage is likely to be double-counted when developing emission inventories for industrial sources. The source of the raw materials and/or manufacturing processes associated with raw material usage may occur outside the state and is not included in the emissions inventory for the state and therefore should not be included in the emissions inventory for the project for the purposes of CEQA.

Substantial research would be required to minimize the speculative nature of trying to characterize indirect emissions for each project. Project proponents would have to determine the origin of the materials used during the construction and/or operation of the project. Additional research would be necessary to gather emission rates for the international vehicles (ship, aircraft, trains, trucks, etc.), global energy production, global industrial processes, and other GHG emitting processes. Even if this information is compiled, the resulting estimates represent an insignificant percentage, as compared to direct project emission.

While indirect emissions from electrical power consumption can be estimated, the estimate is speculative because actual emissions are determined by the source of power used to generate the electricity (wind, fossil fuel, nuclear, hydroelectric, etc), which is largely unknown for the power being consumed by a specific project. Furthermore, the source of power generation is unknown and may occur outside the boundaries of the air basin or the borders of California. Estimates of indirect emissions from electrical power consumption would be speculative and estimates may not be accurate.

Furthermore, traditionally, indirect emissions associated with production of electrical power are not attributed to a development or industrial project. Emissions of criteria pollutants resulting from electrical power generation have already been attributed to the power production facility and the power production facility has already been required to mitigate the impacts of its criteria pollutants emissions. The same logic applies to GHG emissions. Power generating facilities are subject to AB32 emission reduction targets and thus, will be required to mitigate their GHG emissions. Including indirect emissions associated with electrical power consumption would likely double count GHG emissions associated with electrical power generation and overstate a project's environmental impacts.

Indirect emissions associated with waste disposal can be estimated. However, as with indirect emissions associated with electrical power generation, criteria pollutants emissions resulting from waste disposal have already been attributed to the waste disposal facility. Indeed, the waste disposal facility has already been required to

mitigate its operational environmental impacts. As with power generating facilities, waste disposal facilities are subject to AB32 emission reduction targets and thus, will be required to mitigate their GHG emissions. Including indirect emissions associated with waste disposal would likely double count GHG emissions and overstate a project's environmental impacts.

Appendix A

List of Ad Hoc Committee Members

Name	Affiliation
Daniel Barber	San Joaquin Valley Air Pollution Control District
J.P. Cativiela	Dairy CARES
Dennis J. Champion	Occidental of Elk Hills
Casey Creamer	California Cotton Ginners
Tin Cheung	The Planning Center
Dawn S. Chianese	Environ
Kevin Clutter	Conestoga-Rovers & Associates (CRA)
Jerry Frost	Kern Oil
Wendy Garcia	Constellation Wines
Sarah Jackson	EarthJustice
Julia Lester	Environ
Arnaud Marjollet	San Joaquin Valley Air Pollution Control District
Mark Montelongo	San Joaquin Valley Air Pollution Control District
Elena Nuno	Michael Brandman Associates
Dennis Roberts	San Joaquin Valley Air Pollution Control District
Patia Siong	San Joaquin Valley Air Pollution Control District
Dennis Tristao	J.G. Boswell Company
Tom Umenhofer	Western States Petroleum Association
Nicole Vermilion	The Planning Center

CEQA GHG Guidance Project Scope, February 10, 2009

Table 1 - Estimated MT CO₂e for Industrial Project

Greenhouse Gas Emissions for a Powdered Milk Spray Dryer Operation														
C A T	Emission Source	Process Rate units/year	Units	Emission Factors lb-CO2 (eq) /unit			Annual Emissions ton-CO2 (eq) /year			% Emission Category		% Total Emissions (Direct and Indirect)		
				CO2	CH4	N2O	CO2	CH4	N2O	Total	% of Total	Cum. %	% of Total	Cum. %
D I R E C T	Direct Emissions - Stationary Source													
	1	Stationary Combustion	127,896	MMBtu	116.7	0.27	0.068	7,463	17	4	7,484	72.7%	72.7%	64.1%
	2	Onsite Mobil Equipment	6,751	Gallons-LPG	12.7	0.00037	0.005467	43	0	0	43	0.4%	73.2%	64.5%
	Direct Emissions - Construction													
	3	Site Construction						115	0	0	115	1.1%	74.3%	65.5%
	Direct Emissions - Offsite Vehicle Travel													
	4	Milk Delivery	774,551	Heavy Truck Miles	3.72	0.000236	0.00328	1,441	0	1	1,442	14.0%	88.3%	77.8%
	5	Powdered Milk Delivery	589,011	Heavy Truck Miles	3.72	0.000236	0.00328	1,096	0	1	1,097	10.7%	99.0%	87.2%
	6	Employee Vehicles	182,910	Vehicle Miles	1.08	0.0012	0.0219	99	0	2	101	1.0%	99.9%	88.1%
	7	Delivery of Supplies and Consumables	3,704	Heavy Truck Miles	3.72	0.000236	0.00328	7	0	0	7	0.1%	100.0%	88.2%
	Total Direct Emissions						10,264	17	8	10,289	100.0%			
I N D I R E C T	Indirect Emissions - Electric Power													
	8	Operations	2,653	MWh	878.71	0.15	1.1	1,166	0	1	1,167	84.4%	84.4%	98.2%
	9	Miscellaneous	219	MWh	878.71	0.15	1.1	96	0	0	96	6.9%	91.4%	99.0%
	Indirect Emissions - Miscellaneous													
	10	Steel Shipment	1,151,100	ton-miles	0.071	7.37E-05	1.50E-05	41	0	0	41	3.0%	94.4%	99.3%
	11	Spray Dryer Shipping	2,190,000	ton-miles	0.071	7.37E-05	1.50E-05	78	0	0	78	5.6%	100.0%	100.0%
		Total Indirect Emissions						1,381	0	1	1,382	100.0%		
		Total Emissions						11,645	17	9	11,671			100.0%

CEQA GHG Guidance Project Scope, February 10, 2009

Table 2 - Estimated MT CO₂E for the Mixed-Use Development

C A T E G O R Y	Source	Annual Emissions	% Emission Category		% Total Emissions (Direct and Indirect)	
		Metric tons CO ₂ e	% of Total	Cum . %	% of Total	Cum . %
D I R E C T	Motor Vehicles	10,991.0	74.7%	74.7%	60.7%	60.7%
	Refrigerants	1,422.0	9.7%	84.3%	7.8%	68.5%
	Construction	977.9	6.6%	91.0%	5.4%	73.9%
	Natural Gas	811.0	5.5%	96.5%	4.5%	78.4%
	Aerosols	514.0	3.5%	100.0%	2.8%	81.2%
	Landscape	1.0	0.0%	100.0%	0.0%	81.2%
	Hearth	0.0	0.0%	100.0%	0.0%	81.2%
		14,717	100.0%			
I N D I R E C T	Indirect Elect	2,927.0	86.0%	86.0%	16.2%	97.4%
	Steel Transportation	398.5	11.7%	97.7%	2.2%	99.6%
	Water Transport (Elect)	46.0	1.4%	99.0%	0.3%	99.8%
	W aste Disposal	33.0	1.0%	100.0%	0.2%	100.0%
	Lumber Transportation	0.0	0.0%	100.0%	0.0%	100.0%
	TOTAL	3,404	100.0%			
		18,121			100.0%	

The project consists of:

40 acres
201,000 sqft commercial
278,000 sqft office
24 units residential

NOTES:

- (1) The sources and emissions are based on project specific data already available.
- (2) Emissions for waste disposal were obtained using EPA's Waste Reduction Model (WARM).
http://epa.gov/climatechange/wycd/waste/calculators/warm_home.htm
- (3) Data for residential and business waste disposal rate was obtained from the California Integrated Waste Management Board
<http://www.ciwm.b.ca.gov/Profiles/>
- (4) URBEMIS 2007 was used to estimate emissions from construction.

Appendix B

Basis for Greenhouse Gas Estimate for Powdered Milk Spray Dryer Operation

Direct Emissions – Stationary Source

- Maximum Firing Capacity for spray dryer is 14.6 MMBtu/hr natural gas
- Facility will operate 8760 hr/yr
- Burner Utilization is 100%
- Emission factors (with Global Warming Potential) for natural gas combustion are from CCAR, V.3, April, 2008:

	<u>kg/MMBtu</u>	<u>lb/MMBtu</u>	<u>GWP</u>	<u>lb- CO₂E/scf</u>
CO ₂ :	53.06	116.7	1	116.7
Methane:	0.0059	0.013	21	0.27
N ₂ O	0.0001	0.00022	310	0.068

- Emissions for milk evaporation (from delivered milk to 50% concentrate fed to the dryer) are attributed to the existing milk evaporation system (3 boilers) and not included with the dryer.
- 50 hp forklift used to handle bagged product. Operates 8 hours per day with 50% utilization of horsepower and 30% thermal efficiency.
- Emission factors (with Global Warming Potential) for LPG-powered vehicles are from CCAR, V.3, April, 2008 for California:

	<u>g/mile</u>	<u>lb/mile</u>	<u>GWP</u>	<u>lb- CO₂E/gal</u>
CO ₂ :	-	-	1	12.7*
Methane:	0.04	8.81x10 ⁻⁵	21	0.00037**
N ₂ O	0.04	8.81x10 ⁻⁵	310	0.00547**

* CO₂ is based on 5.79 kg/gal for diesel (per CCAR) and an annual fuel consumption of 6,751 gal LPG

** Methane and N₂O are based on hypothetical fuel economy of 5 mpg

Direct Emissions - Construction

- Construction emissions include direct emissions from construction sources at the plant site plus emissions associated with shipping of the spray dryer
- Construction site CO₂ emissions were estimated using URBEMIS and assume a 2 acre site with 10,400 square feet of combined industrial building and office space.
- Methane and N₂O emissions for construction were approximated by factoring from the CO₂ emissions based on the heavy truck emission factors presented above.

Direct Emissions - Offsite Vehicle Travel

- Maximum Milk Solids processing is 84.6 tpd dry product
- Powdered milk product trucks carry 25 tons per round trip and travel 478 miles per round trip at 6 mpg.
- Delivered raw milk quantity is estimated based on 7 wt% milk solids in raw milk.
- Milk delivery trucks travel 44 miles round trip at 6 mpg and carry 6000 gal per round trip.
- Emission factors (with Global Warming Potential) for Heavy Trucks are from CCAR, V.3, April, 2008 for California:

	<u>g/mile</u>	<u>lb/mile</u>	<u>GWP</u>	<u>lb- CO₂E/mi</u>
CO ₂ :	-	3.72*	1	3.72
Methane:	0.0051	1.12x10 ⁻⁵	21	0.00024
N ₂ O	0.0048	1.06x10 ⁻⁵	310	0.00328

* CO₂ is based on 10.15 kg/gal for diesel (per CCAR) and a fuel efficiency of 6 mpg

- Average employee travel is 35 mi round trip with average fuel economy of 18 mpg
- Plant staff:

Administrative Staff:	10 per shift, 5 shifts per week (shared with evaporator)
Operations Supervisor:	1 per shift, 3 shifts per day (shared with evaporator)
Dryer Operators:	2 per shift, 3 shifts per day
Maintenance	5 per shift, 5 shifts per week (shared with evaporator)
Security	1 per shift, 3 shifts per day (shared with evaporator)

- Emission factors (with Global Warming Potential) for Passenger Cars are from CCAR, V.3, April, 2008 for California:

	<u>g/mile</u>	<u>lb/mile</u>	<u>GWP</u>	<u>lb- CO₂E/mi</u>
CO ₂ :	-	1.08*	1	1.08
Methane:	0.026	5.73x10 ⁻⁵	21	0.0012
N ₂ O	0.032	7.05x10 ⁻⁵	310	0.0219

* CO₂ is based on 8.81 kg/gal for diesel (per CCAR) and a fuel efficiency of 18 mpg

Mobile Source Emissions Associated with Shipment of Plant Operating Supplies and Consumables:

- Total installed cost for the dryer system was \$20,000,000 (assumed)

- Annual expense for plant consumables and operating supplies is 2% of TIC = \$400,000/year (2 x typical per Peters and Timmerhaus, Plant Design and Economics for Chemical Engineers, 2nd ed, McGraw-Hill, 1958.)
- Shipping cost for plant consumables and operating supplies is 5% of value or $0.05 \times 200,000 = \$20,000/\text{year}$ (assumed)
- Shipping rate is \$5.40/mi (a shipping expenditure of \$5.40 generates one vehicle mile for a heavy diesel truck – rough estimate based on published UPS shipping rates)

Indirect Emissions - Electric Power

- Operating electrical loads consist of:
 - Main Blower Motor @ 250 hp (per applicant)
 - Rotary atomizer for dryer @ 75 kw power input (basis GEA Niro literature)
 - Pumps for handling milk are 10 bhp (assumed)
 - Product conveying and bagging requires 15 bhp (assumed)
- Electric Motor Efficiency is 90%
- Emission factors (with Global Warming Potential) for electricity usage are from CCAR, V.3, April, 2008 for California:

	<u>lb/MWh</u>	<u>GWP</u>	<u>lb- CO₂E/MWh</u>
CO ₂ :	878.71	1	878.71
Methane:	0.0067	21	0.15
N ₂ O	0.0037	310	1.1

- Miscellaneous electrical loads:
 - Instrumentation and ancillary loads = 2 kw
 - Dryer is housed in a 100' x 100' expanded manufacturing area (indoors) which requires 24 hour lighting at 2.2 W/ft²
 - 400 ft² incremental office space associated with the milk drying operation requiring 2.5 W/ft²
 - Plant outdoor lighting assumed to be existing.

Indirect Emissions - Miscellaneous

- Specific power consumption for ocean shipping (main engine output) is 0.04735 kwh per ton-mile based on data for the "Emma Maersk" (freight capacity of 61,213 tons requiring 80,000 kw to maintain a speed of 24 knots).
- Ship fuel consumption is 203 g/kwh (residual fuel oil) per: Cooper, David, "Representative Emission Factors for use in Quantification of Emissions from Ship Movements Between Port in the European Community", Swedish Environmental Research Institute, 2002.
- Ship transit CO₂ emission factor is 677 g- CO₂ /kw per ARB's "Emission Inventory for Ship Main Engines and Boilers"

- Ship methane and N₂O emission factors are based on CCAR factors for combustion of residual fuel oil at a stationary source and on the calculated fuel consumption.
- Due to length of shipment, emissions due to anchorage and hoteling were assumed to be negligible.
- The dryer is assumed to be procured and shipped from China (Hong Kong to Los Angeles - one-way shipping distance of 7,300 miles) and only cargo ship emissions are considered.
- Dryer is assumed to weigh 300 tons.
- Steel (300 tons) is assumed to be shipped from India to China (Mumbai to Hong Kong – one way shipping distance of 3,837 miles)

Appendix C

Basis for Greenhouse Gas Estimate for a Mixed-Use Development Project

Direct Emissions

Motor Vehicles

- The vehicle percentages are based on default values in URBEMIS 2002.
- The build-out for this project is year 2010.
- The vehicle miles traveled is estimated at 61,000 with 12,200 trips.
- The emission factors for the running emissions are based on the U.S. Environmental Protection Agency and Climate Leaders Greenhouse Gas Inventory Protocol – Core Module Guidance, for direct emissions from mobile combustion sources.
- The emission factors for the starting emissions are based on the U.S. Environmental Protection Agency EPA420-P-04-016 (Update of Methane and Nitrous Oxide Emission Factors for On-highway Vehicles).

Refrigerant

- It is assumed that there are 24 domestic refrigeration units, about 490 units of Residential/office/commercial A/C ranging in capacity.
- An annual leak rate in percent of capacity is included.

Construction

- URBEMIS 2007 was used to obtain emissions from construction.
- The analysis evaluates the project consisting of 40 acres, 201,000 square feet of commercial land use, 278,000 square feet of office land use, and 24 multi-dwelling residential units in Fresno County.
- The construction timeline was one year.

Natural Gas

- A natural gas usage factor based on default value in URBEMIS 2002 for methane and nitrous oxide was assigned to the type of land (e.g.: office, retail/shopping, residential, etc.) and its associated square footage or units.

Aerosols

- MOBILE6 and URBEMIS 2007 were used to estimate the carbon emissions for this arena.

Landscape

- URBEMIS 2007 was used to obtain landscape emissions.

Hearth

- No hearth emissions were included as there were no wood-burning fireplaces in the development per City of Fresno code, however if hearths were allowed URBEMIS 2007 would have been used to provide the hearth emissions.

Indirect Emissions

Electricity

- The emission factor was obtained from the General Reporting Protocol – Reporting Entity-wide Greenhouse Gas Emissions, Version 2.2, March 2007 by the California Climate Action Registry.
- The residential electricity usage rate was assumed to be 5626.50 kwh/unit/yr based on South Coast Air Quality Management 1993 CEQA Handbook, Table 9-11-A.
- The electricity use was based on Table E-1 from the California Energy Commission - California Commercial End-Use Survey March 2006.
- The analysis evaluates the project consisting of 201,000 square feet of commercial land use, 278,000 square feet of office land use, and 24 multi-dwelling residential units.
- The total electricity use is about 8,000 MWh/year.

Steel Transportation

- Specific power consumption for ocean shipping (main engine output) is 0.04735 kwh per ton-mile based on data for the “Emma Maersk” (freight capacity of 61,213 tons requiring 80,000 kw to maintain a speed of 24 knots).
- Ship fuel consumption is 203 g/kwh (residual fuel oil) per: Cooper, David, “Representative Emission Factors for use in Quantification of Emissions from Ship Movements Between Port in the European Community”, Swedish Environmental Research Institute, 2002.
- Ship transit CO₂ emission factor is 677 g- CO₂ /kw per ARB’s “Emission Inventory for Ship Main Engines and Boilers”
- Ship methane and N₂O emission factors are based on CCAR factors for combustion of residual fuel oil at a stationary source and on the calculated fuel consumption.
- Due to length of shipment, emissions due to anchorage and hoteling were assumed to be negligible.
- The steel is assumed to be shipped from India to Los Angeles – (one-way shipping distance of 10,500 miles) and only cargo ship emissions are considered.
-

Water Transport (Electricity use in typical urban water systems)

- Emission factor was obtained from the General Reporting Protocol – Reporting Entity-wide Greenhouse Gas Emissions, Version 2.2, March 2007 by the California Climate Action Registry.

- Emission factor was also from the California's Energy-Water Relationship Final Staff Report, November 2005 by the California Energy Commission.
- It is assumed that there's about 80,000 gallons per day of water and about 115,000 kWh in energy usage.

Waste Disposal

- Waste disposal data was obtained from the California Integrated Waste Management Board – 1999 estimated materials disposed by residential sector and 1999 estimated business waste amounts for Fresno County.
- It is estimated that 137 tons of waste would be generated.
- Data was entered into US EPA's Waste Reduction Model to obtain greenhouse gas emissions.

Lumber Transportation

- It is assumed that lumber is shipped to Fresno from Springfield, Oregon. The one-way travel distance is 669 miles.
- It is estimated that 16,000 board feet of lumber is needed for a house of 2,000 square feet.
- The number of train hauling cars is 75 cars in which 24 would be used to transport lumber. The hauling capacity is about 100 tons per cars which would equate to about 12,000 board feet of lumber.
- The conversion emission factor for diesel is 0.0287 kg CO₂ /mile based on the calculation tool provided by the GHG Protocol – Mobile Guide, Version 1.3, March 2005.

Appendix D

Summary of Written Comments

Written comments pertaining to proposed recommendations for establishing the scope of a project's greenhouse gas impacts are summarized below.

1. Sarah Jackson (Earth Justice)

One of CEQA's main functions is to provide public agencies and the general public "with detailed information about the effects of a proposed project on the environment." *San Franciscans for Reasonable Growth v. City & County of San Francisco*, 151 Cal. App. 3d 61, 72 (1984). Full analysis of all direct and indirect emissions caused by a project, using a lead agency's "best efforts to find out and disclose all that it possibly can," CEQA Guidelines section 15144, will provide maximum opportunities for mitigation and will allow for more environmentally sound decision-making. Furthermore, CEQA requires that indirect or secondary effects "which are caused by the project and are later in time or farther removed in distance, but are still reasonably foreseeable," CEQA Guidelines section 15358(a), be analyzed. Both the ARB and South Coast have determined that lifecycle analyses of GHGs are appropriate and South Coast recently proposed that lifecycle analyses be prepared for all projects undergoing CEQA analysis in order to "produce a more defensible approach." See South Coast Interim GHG Significance Threshold Staff Proposal at 3-7, October 2008. Categorical exclusions of emissions from analysis is contrary to CEQA's purpose and would minimize the true environmental impact of the project.

2. Gordon Nipp (Kern-Kaweah Chapter of Sierra)

- Emissions from project electricity consumption can be estimated by following the Climate Action Registry protocol. The basic methodology uses updated US EPA-developed EGRID emission factors for calculating indirect emissions from electricity use. For California, this factor is 878.71 pounds of CO₂ per MWh of usage, a figure that is lower than for many other regions because it includes renewables production. While anyone can call any such figure "speculative", this protocol is in current usage and is well established. Electricity consumption estimations should not be considered speculative.
- Including indirect emissions associated with a project's electricity consumptions as part of the project's environmental impact and requiring mitigation for this impact would not lead to double counting of these emissions. If, for example, a project were required as mitigation to generate a portion of its electricity with solar PV, the electricity generated by the project's PV would not have to be generated by a power plant. The power plant would not be required to mitigate

impacts of electricity generated by project PV, electricity that the power plant doesn't have to generate.

- Indirect GHG emissions from electrical power generation should be included during CEQA review.

3. Wendy Garcia (Constellation Wines)

1) Regarding power consumption: I believe the project scope recommendations would be stronger by removing statements such as:

"Estimating emissions from electrical power consumption is speculative because the actual source of generation (wind, fossil fuel, nuclear, hydroelectric, etc) and location of generation (within or outside California) is unknown."

These emissions can be estimated. Power providers such as PG&E, SCE and others contract with, and purchase power from, specific electrical generators. It is not speculative.

2) The de minimus level for reporting of GHG emissions is 3 to 5 percent, depending upon the reporting program. In the scope recommendation document indirect emissions are greater than 5% of total GHG emissions, so they are significant, but for the other reasons cited, indirect emissions should be left out of the scope for quantifying GHGs for CEQA purposes.

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Appendix F:

**CEQA GHG Guidance Level of Significance
Subcommittee (March 5, 2009)**

CEQA GHG Guidance Level of Significance Subcommittee

May 5, 2009

The District has actively sought input from the ad hoc committee and the following document is still under development. The District is still receiving comments from the committee, which will be considered before finalizing this document.

Ad Hoc Committee Members

Bettina Arrigoni, Daniel Barber, John Beckman, David Campbell, Donna Carpenter, Dennis J. Champion, Tin Cheung, Dawn S. Chianese, Casey Creamer, Caroline Farrell, Jerry Frost, Wendy Garcia, Issac A. George, Spencer Hammond, Erin Burg Hupp, Sarah Jackson, Bob Keenan, Julia Lester, John Ludwick, Arnaud Marjollet, Michael B. McCormick, Mark Montelongo, Gordon Nipp, Elena Nuno, Tonya Short, Patia Siong, David Smith, Lee Smith, Dennis Tristao, Tom Umenhofer, Lisa Van De Water, and Nicole Vermilion.

See Appendix A

Climate Change Action Plan
GHG CEQA Technical Workgroup--Level of Significance Subcommittee
May 5, 2009

Introduction

During the Greenhouse Gas (GHG) CEQA Guidance Technical Workgroup meeting an ad hoc committee was formed to provide guidance/recommendations to be applied when determining the significance project specific GHG emissions during the CEQA environmental review process.

Key tasks for the subcommittee include:

- Review of current CEQA requirements/guidelines for determining significance, including lead agency authority and responsibilities for determining significance
- Review actions by the following agencies that are to be developing GHG significance thresholds: Office of Planning and Research (OPR), California Energy Commission (CEC), Caltrans, Air Resources Board (ARB), South Coast Air Quality Management District (SCAQMD), Council of Governments (COG), and California Air Pollution Control Officers Association (CAPCOA)
- Discuss committee views on establishing GHG significance thresholds. In support of the discussion, the subcommittee identified the following key questions to be addressed:
 1. Zero Threshold:
 - What are the pros and cons of implementing a zero significance threshold?
 - What are the pros and cons of implementing a zero versus a non-zero significance threshold?
 2. If a non-zero threshold would be recommended, should the metric for determining significance consist of a numerical threshold, a qualitative assessment, or are both approaches valid?
 3. If there is a dual path (qualitative and quantitative), is it necessary to demonstrate equivalency, if so, how?
 4. If a numeric value is established, is the value specific to a project type, or does the same value apply to all project types?
 5. What metrics should be considered in establishing a quantitative threshold?
 6. What metrics should be considered in establishing a qualitative significance threshold?

Several discussions were coordinated on these key objectives over four conference calls that were held on January 15, 23, 28, February 2, 6, and 10, 2009. Written comments received by the District are presented in Appendix K. The following summarizes the committee's progress.

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GHG CEQA Technical Workgroup--Level of Significance Subcommittee
May 5, 2009

Review of Lead Agency Authority and Responsibilities

To establish a common understanding, the subcommittee reviewed current CEQA requirements/guidelines for determining significance, including lead agency authority and responsibilities for determining significance. Subsequently, the subcommittee reviewed OPR's draft amended CEQA Guidelines for addressing GHG impacts during the CEQA process. The committee concludes that most of OPR's draft provisions are logical extensions of the CEQA and the provisions do not functionally change lead agency authority and responsibility under CEQA. The following are the main factors of OPR's proposed amendments to CEQA Guidelines addressing GHG impacts, (See *Appendix B* for more detail):

- 1) Exceedance of thresholds;
- 2) Emissions calculated and compared to a threshold, qualitative, or performance-based standards [for editorial additions, see reference 15064.4 (b) (4)];
- 3) Other agency thresholds can be used to set levels;
- 4) Increase or decrease in energy use/efficiency (not clear whether local or regional); and
- 5) Projects impact on attainment to AB 32 goals.

Review of Other Agencies Approaches to Determine GHG Significance

The group reviewed approaches proposed or adopted by the following agencies:

- Office of Planning and Research (OPR), (*Appendix B*)
- California Energy Commission (CEC), (*Appendix C*)
- Caltrans,
- Air Resources Board (ARB), (*Appendix D*)
- South Coast Air Quality Management District (SCAQMD),
- Council of Governments (COG), and
- California Air Pollution Control Officers Association (CAPCOA) (*Appendix E*)

Views on Determining GHG Significance

To provide for stakeholder input the District encouraged subcommittee members to discuss their views on various approaches for determining significance of project related GHG. To facilitate the discussion, the subcommittee is working through the key questions identified above. The following discussion summarized the subcommittee's progress.

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GHG CEQA Technical Workgroup--Level of Significance Subcommittee
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Zero Threshold

1. Zero Threshold:

- *What are the pros and cons of implementing a zero significance threshold?*
- *What are the pros and cons of implementing a zero versus a non-zero significance threshold?*

There are two fundamental approaches; establish a zero threshold, meaning that any project that emits GHG emissions has a significant impact, or establish a non-zero threshold, meaning that projects below a threshold would be determined to have a less than significant impact. There was considerable discussion and strong opinions on this issue.

The underlying concept of a zero threshold is that there is no level below which project specific GHG emissions would be considered to have a less than significant impact. Those recommending adoption of a zero threshold cite the following reasons:

- Would accelerate attainment of AB32 emission reduction targets
- Mitigating to zero would ensure that a project would not have a significant individual and cumulative impact
- Very easy to understand if a project would be considered significant
- Projects with GHG emissions would require preparation of an environmental impact report (EIR), thus requiring lead agencies to require all feasible mitigation measures
- No scientific basis to conclude that any level, other than zero, would not have a significant impact on global climatic change

The underlying concept of a non-zero threshold is that there is a level below which it is reasonable to conclude that project specific GHG emissions would have a less than significant impact. Those in favor of adopting a non-zero threshold cite the following reasons:

- Adopting a zero threshold would result in all projects with GHG emissions being determined to have a significant impact, thus requiring preparation of an EIR for every project with GHG emissions
- CEQA does not require mitigating project related impacts to less than significant and since it is not technically or economically feasible to mitigate to zero, most likely, projects would be approved by adopting overriding considerations
- To mitigate project related GHG emissions to less than significant would require mitigation of 100 percent of all GHG emissions

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GHG CEQA Technical Workgroup--Level of Significance Subcommittee

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- Not technically feasible to mitigate all projects with GHG emissions to zero, without stopping growth within the District and perhaps, California
- No scientific basis to conclude that a specific project would have a measurable impact on global climatic change

Non-Zero Threshold

2. *If a non-zero threshold would be recommended, should the metric for determining significance consist of a numerical threshold, a qualitative assessment, or are both approaches valid?*

There was considerable discussion surrounding these two questions with little resolution at this time. The major theme is that there is no scientific information available at this time to support a numeric value. The subcommittee acknowledges that ARB and South Coast AQMD both have proposed establishing thresholds based on percentages of the emission inventory for industrial sources. The subcommittee also acknowledges that OPR in drafting amendments to CEQA Guidelines provide for significance determinations based on either quantitative or qualitative assessments. The subcommittee further acknowledges that guidance being developed by ARB and South Coast includes provisions for both qualitative and quantitative determinations. The majority opinion is that if a non-zero approach is adopted, there should be flexibility to use both quantitative and qualitative approaches.

Qualitative Versus Quantitative Significance Determination

3. *If there is a dual path (qualitative and quantitative), is it necessary to demonstrate equivalency, if so, how?*
4. *If a numeric value is established, is the value specific to a project type, or does the same value apply to all project types?*

The District diagrammed four possible approaches illustrating how quantitative and qualitative standards could be used for assessing project related GHG impacts, (Appendix F – J). One approach is to evaluate significance based on whether or not a project is consistent with a quantitative standard OR is below some qualitative standard. Another approach presented is to evaluate significance based on whether a project is consistent with a qualitative standard AND is below some quantitative standard. The third and fourth approaches would evaluate significance based on a tiered or “Waterfall” approach, which could be a combination of quantitative and qualitative standards. It was recognized that regardless of the approach used, projects determined to be exempt under CEQA would be considered to have a less than significant impact.

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The pros and cons of each approach were explored and the following common themes emerged:

- Other than if a single numerical value were to be applied across all projects, qualitative and quantitative significance standards should be developed for each type of emission source (sectors). Identified sectors included development projects, transportation projects, energy production, and industrial projects.
- It will take time to develop qualitative standards and there is reasonable probability that the standards will be controversial and subject to litigation. In the interim, lead agencies and project proponents still have to assess project impacts on a case by case basis.
- There is a lack of information to establish numerical thresholds based on scientific information.
- Qualitative assessments should be, based in part, on compliance with established GHG emission reductions targets such as those established in AB32 or SB375, or approved performance standards.
- Because a project is not subject to CEQA does not necessarily mean that it is not subject to AB32.
- A qualitative approach could be fashioned similar to the Indirect Source Review (ISR) approach.

Metrics to Consider in Establishing a Quantitative or Qualitative Threshold

5. *What metrics should be considered in establishing a quantitative threshold?*
6. *What metrics should be considered in establishing a qualitative significance threshold?*

In addition to the above concepts, the subcommittee discussed establishing a quantitative threshold for residential developments in which project related GHG emissions would be compared to a per capita threshold, or other unit to be determined, i.e. square foot, etc. This concept could be consistent with implementation of SB375.

The subcommittee gave significant time to discussing the availability of validated scientific information that could be used to establish project specific quantitative thresholds. Certain committee members share the opinion that there is compelling information demonstrating that any increase in GHG emissions has a significant impact on global climatic change. However, other committee members share the

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opinion that the existing scientific information is insufficient to support establishing project specific significance thresholds.

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May 5, 2009

Appendix A

Ad hoc Subcommittee Members:

Name	Affiliation
Bettina Arrigoni	Global Energy Partners, LLC
Dan Barber	SJVAPCD
John Beckman	Building Industry Assoc. of the Delta
David Campbell	Tricor
Donna Carpenter	Sikand Engineering
Dennis Champion	Occidental of Elk Hills
Dawn S. Chianese	Environ
Tin Cheung	The Planning Center
Casey Creamer	California Cotton Ginners
Caroline Farrell	Center on Race, Poverty & Environment
Jerry Frost	Kern Oil
Wendy Garcia	Constellation Wines
Issac A. George	City of Arvin
Spencer Hammond	Chevron
Erin Burg Hupp	Attorney at Law-Meyers Nave
Sarah Jackson	Earth Justice
Bob Keenan	HBATK
Julia Lester	Environ
John Ludwick	Berry Petroleum Company
Arnaud Marjollet	SJVAPCD
Michael B. McCormick	PMC
Mark Montelongo	SJVAPCD
Gordon Nipp	Kern-Kaweah Chapter of Sierra Club
Elena Nuno	Michael Brandman Assoc.
Tonya Short	HBA of Kern County
Patia Siong	SJVAPCD
David Smith	DMD Associates
Lee Smith	Attorney-Stoel Rives
Dennis Tristao	J.G. Boswell Company
Tom Umenhofer	Western States Petroleum Association
Lisa Van de Water	SJVAPCD
Nicole Vermilion	The Planning Center

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Appendix B

Agency Review & Activities:

Office of Planning and Research

This memorandum summarizes the relevant OPR CEQA guideline revisions that may impact the District's quest to define significant GHG impacts. Of most importance is the new Guideline section 15064.4 that describes significant GHG impacts, section 15126.4 concerning mitigating GHG impacts and the minor changes to Appendix G the initial study form.

In summary (these are set out in more detail below), the following are the main factors that the OPR draft uses to measure significance:

- 1) Exceedance of thresholds;
- 2) Emissions calculated and compared to a threshold, qualitative, or performance-based standards [for editorial additions, see reference 15064.4 (b) (4)];
- 3) Other agency thresholds can be used to set levels;
- 4) Increase or decrease in energy use/efficiency (not clear whether local or regional); and
- 5) Projects impact on attainment to AB 32 goals.

The OPR document consists of some introductory comments and draft revisions to the guidelines that relate to Greenhouse gases. This Summary just discusses the more significant sections.

1. The document indicates in the introduction that OPR intends to rely on CARB to recommend a method for setting significance thresholds.
2. The draft guidelines add a new section 15064.4 titled "Determining the Significance of GHG Emissions", and it includes a suggestion of situations that might be considered significant. A project may be significant to the extent that it:
 - a. Helps or hinders the attainment of GHG emission goals;
 - b. The extent to an increase or decrease in consumption of fuels or other energy resources (especially fossil fuels);
 - c. May result in increased efficiency with respect to GHG emissions;
 - d. Exceeds a threshold of significance;
 - e. This section also includes a provision that the Lead agency must make its own "good faith" effort to actually calculate the level of GHG emissions "including emissions associated with energy

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consumption”; using a model or methodology; and relies on qualitative or other performance based standards for estimating the significance of greenhouse gas emissions.

Other relevant sections:

1. 15064.7(c) which offers little guidance in setting thresholds of significance, but notes that lead agencies may consider thresholds set by other agencies;
2. 15093(d) which discusses overriding consideration indicates that local projects can be approved with significant effects if there are region-wide or statewide benefits;
3. 15126.4(c) which adds “Mitigation Measures Related to Greenhouse Gases” including energy consumption mitigation measures;
4. 15150(b)(1)(B) which encourages reliance on other EIRs that discuss greenhouse gases;
5. 15152(i) which encourages tiering from other EIRs;
6. 15130(b)(1)(B) which allows agency to use summary of projections in cumulative impacts discussion based on EIRs for other local and regional plans; and
7. 15130(f) whose cumulative impacts may be significant.
8. Adds to Appendix – which identifies potential significant effects and whether an EIR is required, contains sections regarding GHG impacts on forestry, emphasizes Vehicle Miles Traveled (VMT) and de-emphasizes Level of Service (LOS) in the Transportation/Traffic section, and adds general greenhouse gas impacts that would trigger the potential to be significant as follows:

GREENHOUSE GAS EMISSIONS

Would the project:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment, based on any applicable threshold of significance?
2. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

CONCLUSION

Most of these provisions are logical extensions of the CEQA process. The difficulty will be determining emissions and setting numerical thresholds which are not resolved herein.

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Appendix C

Agency Review & Activities:

California Energy Commission

The California Energy Commission (CEC) is the lead agency for power plant siting under California law, and has licensing authority for all thermal power plants with capacity of 50 MW or more that are proposed for construction within the state. The CEC's licensing process, which includes extensive environmental impact review, has been certified as the functional equivalent of the CEQA environmental impact review (EIR) process. Traditionally, the CEC EIR has used a "no cumulative impact" argument in response to GHG emissions. CEC staff feel confident in this assessment in light of the fact that new, cleaner power plants will displace energy needed from marginal, older, "dirtier" power plants, causing a net decrease in the system-wide GHG emissions. So, as long as there are "dirty" plants and plants that run less efficiently than new plants, the displacement argument holds.

However, in response to ARB's Scoping Plan and anticipated implementation of AB 32, CEC staff and the CEC are taking a closer look at how they deal with GHG in their EIR findings. The Siting Committee held two workshops⁷⁴ in October and November in and accepted subsequent written comment, to discuss conceptual interim approaches for evaluating GHG emissions from new power plants. Potential threshold approaches were discussed amongst committee members, staff, industry representatives and environmental representatives including:

Zero threshold - mitigation for all projects;
System threshold - mitigation for some projects;
System/local-reliability-areas (LRA) threshold - mitigation based on LRA; and
"Best available control technology" - mitigation by technology.

Most of the discussion bounced between the zero-threshold (environmental representatives) and the system-threshold (industry representatives). Several of the industry representatives stated that they are already mitigating by applying best available control technology whenever possible. By the end of the discussion, the Siting Committee directed staff to conduct (actually, a consultant will conduct) a Generic System Analysis to understand the implications of changes to the energy system upon the addition of a new power plant. This analysis is due back to staff in February or March for internal review. It is

⁷⁴ The transcript and other documents from this workshop are available at
http://www.energy.ca.gov/ghg_powerplants/documents/

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possible that this general analysis may be used programmatically for future EIR analyses for new power plants, but at this point it is unclear.

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Appendix D

Agency Review & Activities:

ARB Preliminary Guidelines Significance Standards

Framework of ARB's Preliminary Proposal for GHG Significance Levels

The Preliminary Proposal proposes guidelines for residential, commercial and industrial projects. A residential or commercial project is categorized as a project that is either: 1) statutorily or categorically exempt; 2) less than significant because it complies with either a previously approved CEQA-compliant programmatic document or a combination of quantitative and performance standards; or 3) significant and requiring preparation of an EIR. An industrial project may also be either 1) categorically or statutorily exempt, or; 2) meet a combination of quantitative and performance standard thresholds to achieve a less than significant CEQA status.

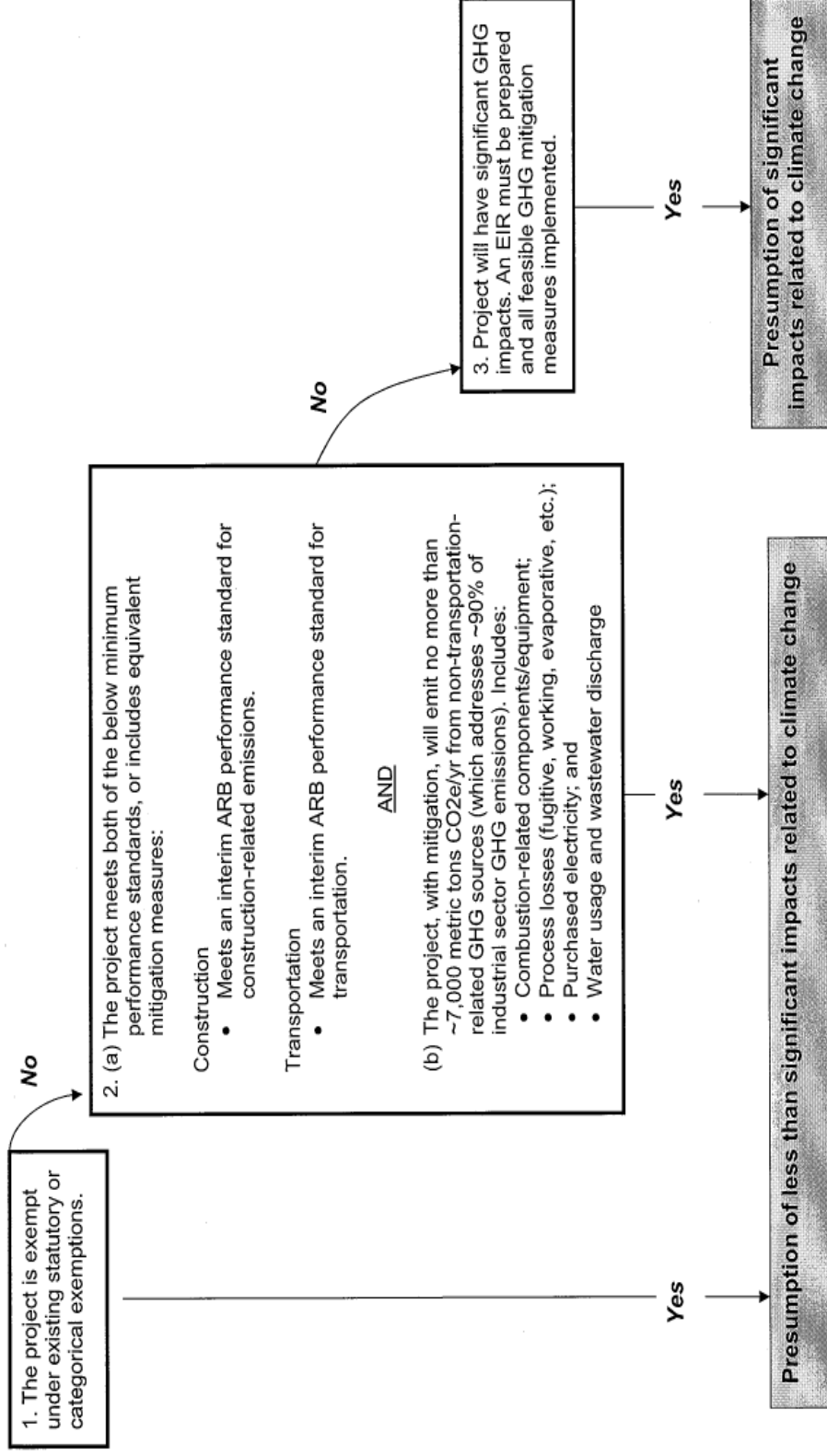
Please see attached flow charts from ARB's preliminary proposal.

For more information (including a power point that expands on performance standards):

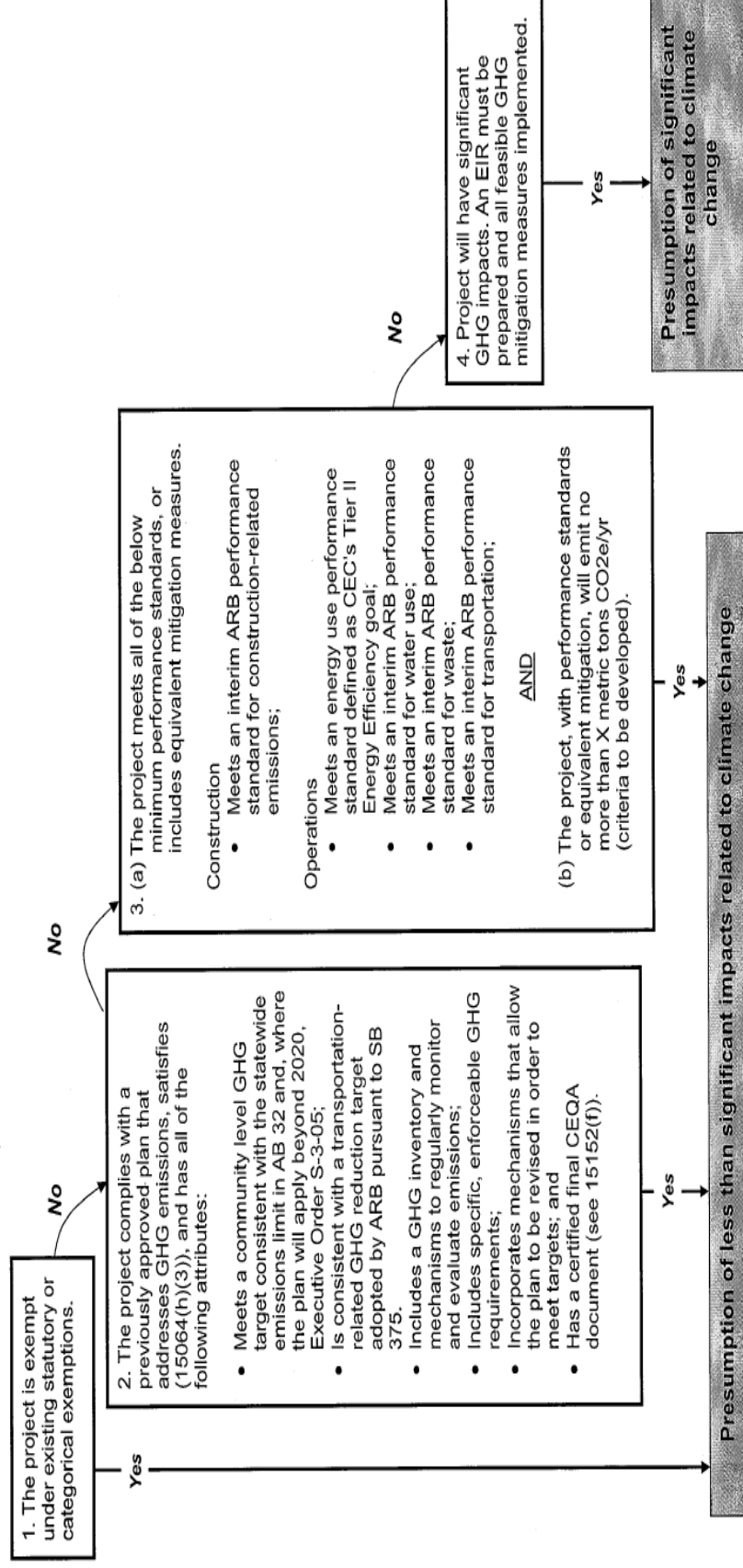
<http://www.arb.ca.gov/cc/localgov/ceqa/meetings/meetings.htm>

ATTACHMENT A

Preliminary Draft Proposal for Industrial Projects



ATTACHMENT B Preliminary Draft Proposal for Residential and Commercial Projects



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Appendix E

Agency Review & Activities:

CAPCOA Recommendations

Industrial Sources

CAPCOA supports a bifurcated approach to CEQA review and mitigation for industrial emission sources, as follows:

1. Require all new industrial sources of GHG emissions to meet specific GHG performance standards established for each equipment type or source category of emissions. Additionally, any new industrial source exceeding 25,000 tons of CO₂E per year after meeting the specified performance standards would be deemed to have a potentially significant adverse impact on the environment and would be analyzed and mitigated as required under CEQA.

OR

2. A jurisdiction could establish a CEQA significance threshold for industrial sources designed to capture and mitigate 90% of industrial source emissions. All new industrial sources exceeding the established threshold would be considered significant and subject to CEQA review and mitigation. Industrial sources with GHG emissions below the threshold would not be subject to performance standards and would not require mitigation or CEQA review for GHG impacts.

CAPCOA believes each option would be functionally equivalent in the level of GHG emission reductions achieved from new industrial source projects. The bifurcated approach allows lead agencies the flexibility to choose the type of CEQA threshold best suited to their local review process for industrial projects proposed within their jurisdiction.

Residential and Commercial Projects:

CAPCOA has not yet reached consensus on a recommended approach regarding CEQA thresholds for residential and commercial projects.

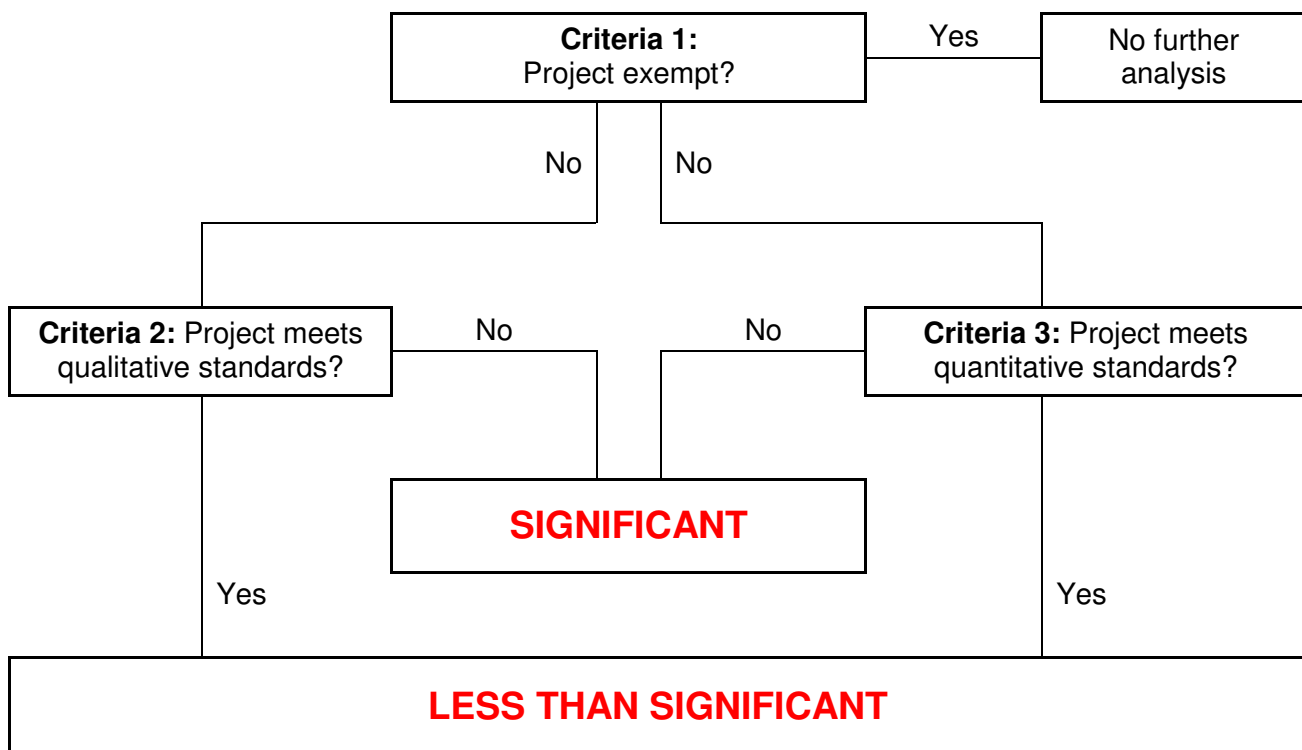
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Appendix F

Qualitative OR Quantitative Significance Determination

Qualitative OR Quantitative Approach

(Criteria 2 OR Criteria 3)



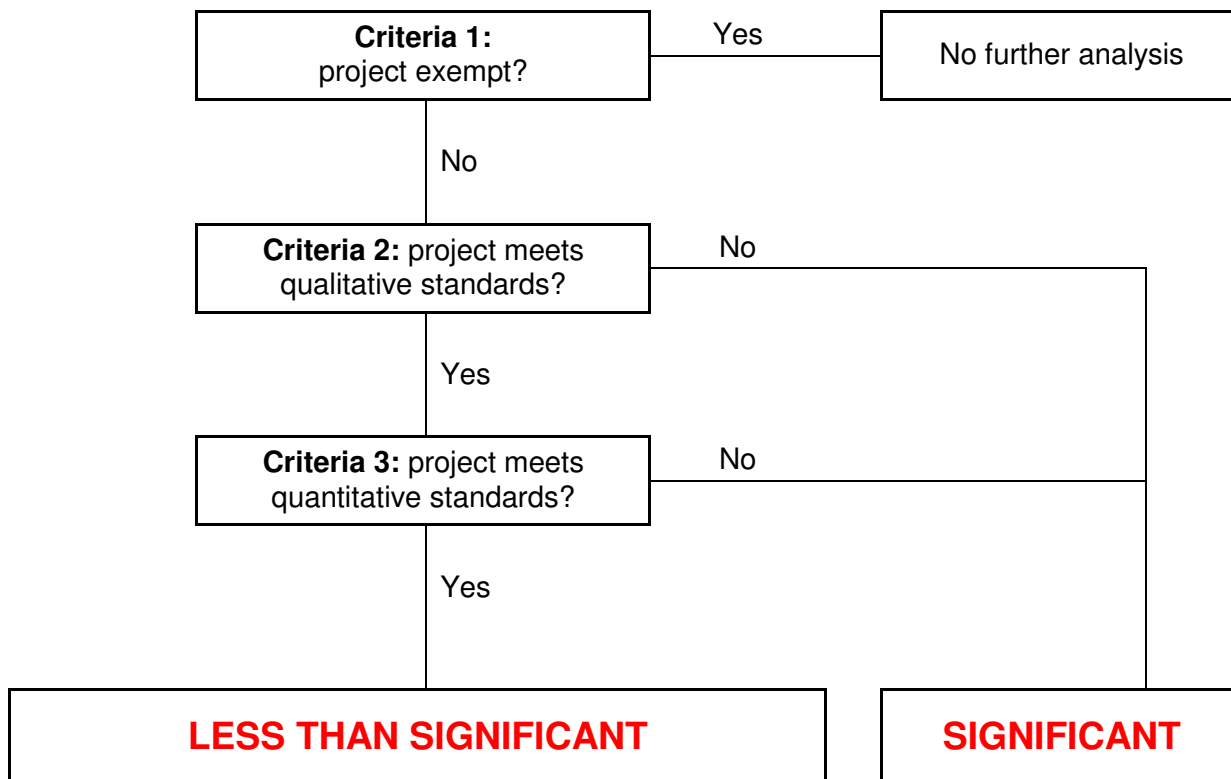
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Appendix G

Qualitative AND Quantitative Significance Determination

Qualitative AND Quantitative Approach

(Criteria 2 AND Criteria 3)

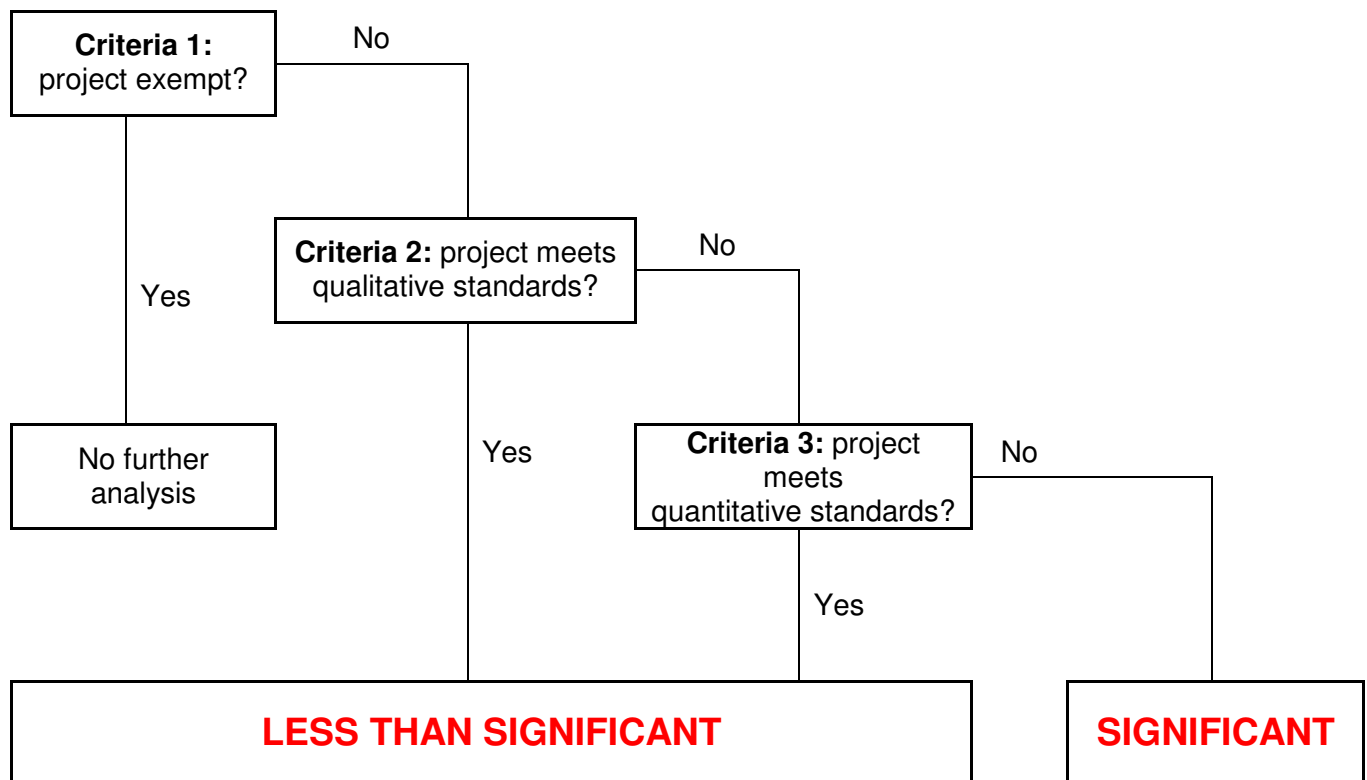


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Appendix H

Cascade Significance Determination Method 1

MIXED 1: Qualitative / Quantitative CASCADE Approach (OR)



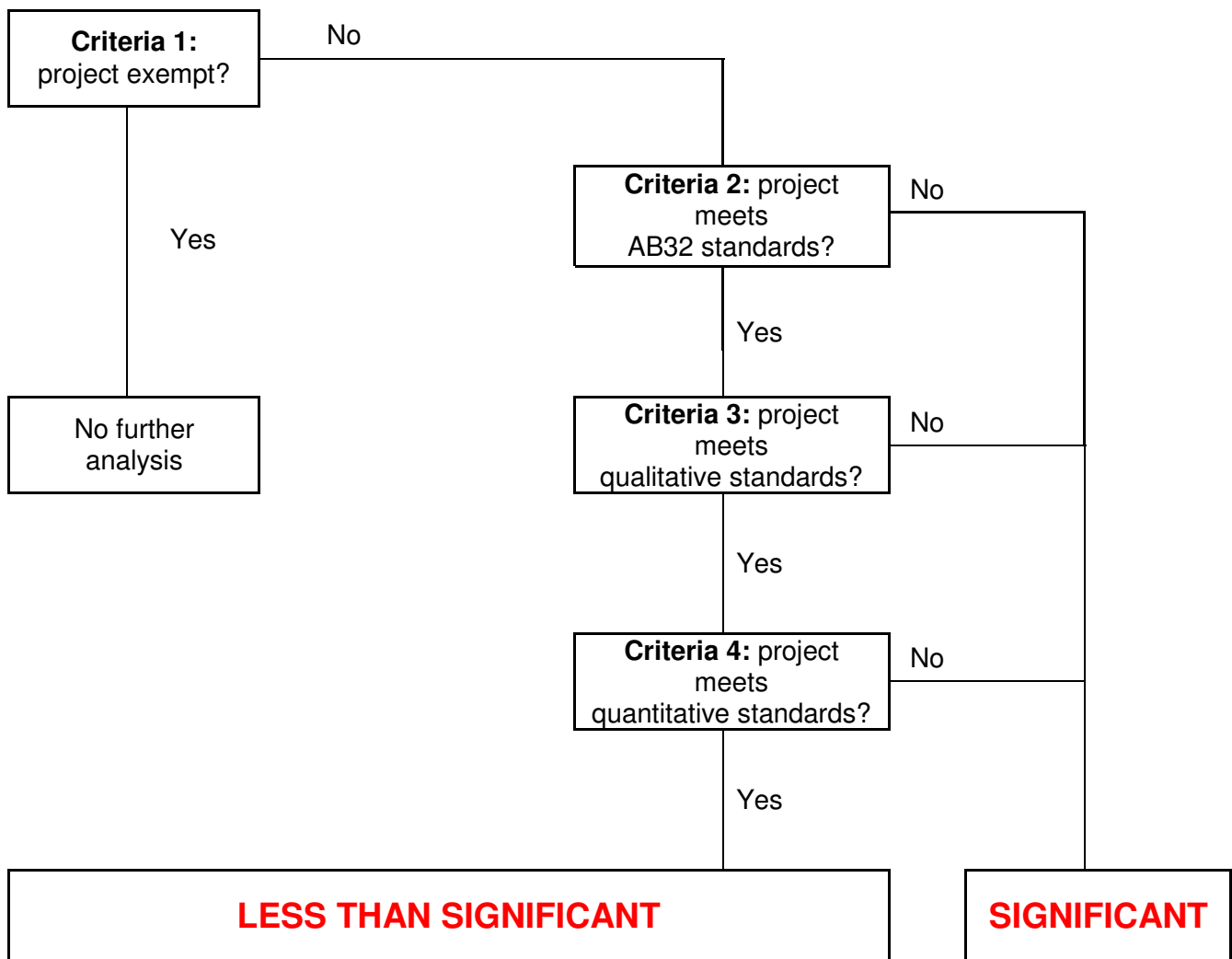
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Appendix I

Cascade Significance Determination Method 2

MIXED 2: Qualitative / Quantitative CASCADE Approach (AND)

*(Criteria 2) **AND** (Criteria 3 and 4)*



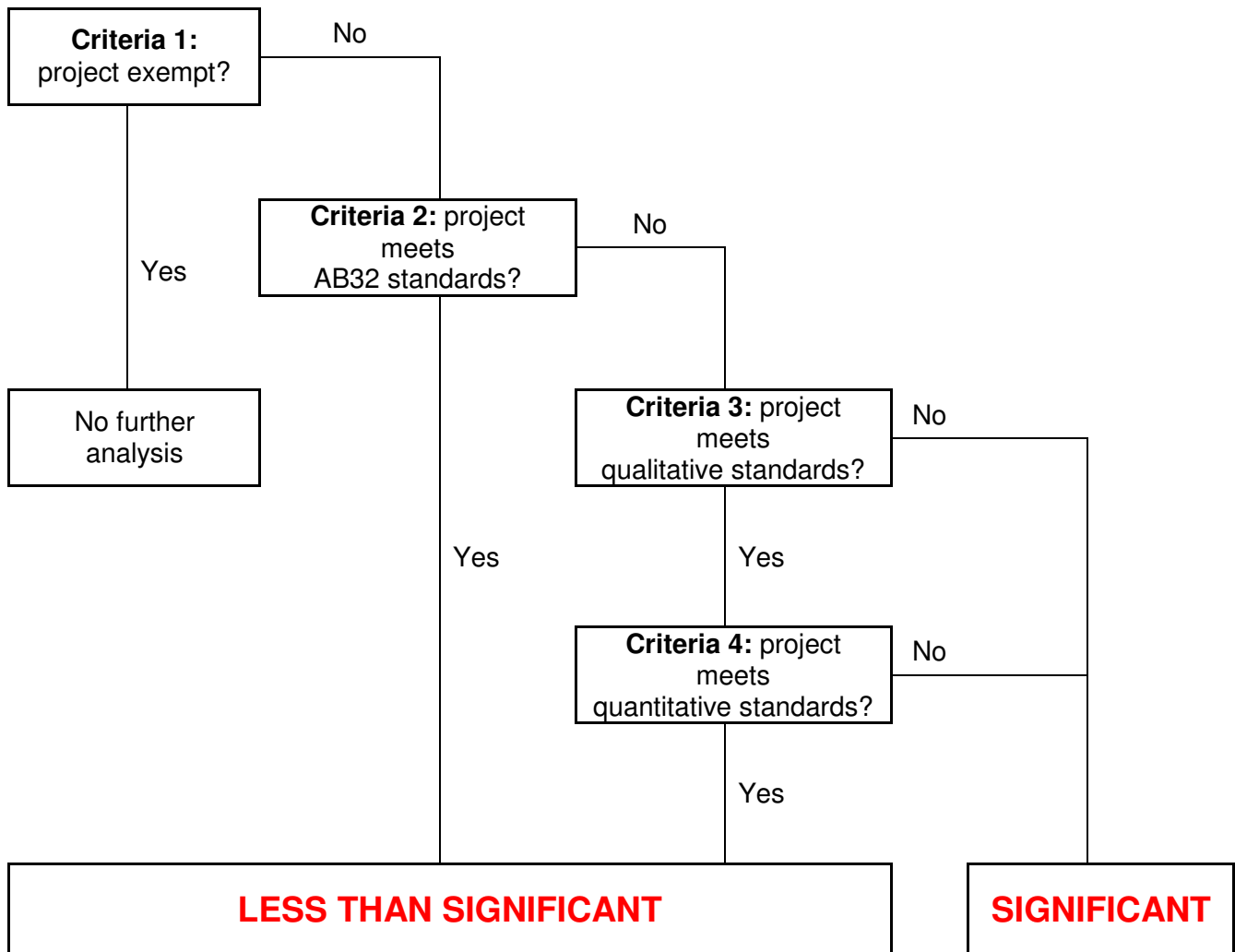
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Appendix J

Cascade Significance Determination Method 3

MIXED 2: Qualitative / Quantitative CASCADE Approach (OR / AND Mixed)

(Criteria 2) OR (Criteria 3 and 4)



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GHG CEQA Technical Workgroup--Level of Significance Subcommittee
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Appendix K

Summary of Written Comments Received

Written comments pertaining to significance levels are summarized below.

1. Gordon Nipp (Kern-Kaweah Chapter of Sierra)

I attach the papers by James Hansen that I see as authoritative. While they won't give the Air District specific guidance on what number to set as a significance threshold under CEQA, they speak to the seriousness of the problem. Of course, under CEQA, the more serious the problem, the lower the threshold. Global warming is perhaps the most serious problem our species has ever faced - hence the call for a zero threshold.

Attachment 1:

Hansen, J., Mki. Sato, P. Kharecha, D. Beerling, R. Berner, V. Masson-Delmotte, M. Pagani, M. Raymo, D.L. Royer, and J.C. Zachos, 2008: Target atmospheric CO₂: Where should humanity aim? *Open Atmos. Sci. J.*, **2**, 217-231, doi:10.2174/1874282300802010217.

<http://arxiv.org/abs/0804.1126>

<http://arxiv.org/abs/0804.1135>

Attachment 2:

Testimony by James Hansen: Global Warming Twenty Years Later: Tipping Points Near

www.columbia.edu/~jeh1/2008/TwentyYearsLater_20080623.pdf

(Note: a link to this document is also available on the District website under the section "Documents" at http://www.valleyair.org/Programs/CCAP/CCAP_idx.htm)

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2. Thomas A. Umenhofer (Western States Petroleum Association)

It is critical that any CEQA GHG Threshold of Significance be a reasonable, balanced, and equitable approach which harmonizes the requirements of CEQA, AB 32, and SB 375. SJVAPCD staff has identified a representative range of options. At this time, Western States Petroleum Association (WSPA) encourages a “cascade approach with off-ramps”. It is understood that current CEQA GHG Threshold of Significance efforts are considered Phase 1 (Technical Workgroup Stakeholder Input) of a multi-phased Climate Change Action Plan (CCAP) process. As the process proceeds into Phase 2 (Development of CEQA Guidance), WSPA believes that the following key points discussed during Phase 1, be carried forward:

- Quantitative (numeric) thresholds for purpose of defining a significant impact of CEQA GHGs pursuant to climate change (a global concern) currently have no scientific basis. In the absence of a legitimate scientific basis, the establishment of quantitative thresholds of significance is problematic and without justification.
- Compliance by individual projects with the provisions of AB 32 (and SB 375), including participation in a cap and trade program, will result in a reduction in state GHG emissions. Accordingly, the net state GHG reductions by definition would result in a net environmental benefit and, therefore, projects which comply with the provisions of AB 32 (and SB 375) should not require additional analysis under CEQA.
- Performance standards do have basis in practice.
- It is anticipated that significant future research and development (R&D) will be necessary in the area of energy efficiency and GHG reduction opportunities pursuant to AB 32. Thresholds of Significance should incorporate flexibility to allow for credit for applying successful new technologies. Without providing a mechanism for crediting future beneficial programs, there will be no incentive for early initiation of key R&D activities.

3. Robert Boston (Berry Petroleum Company)

Berry encourages the enclosed cascade approach very similar to attachments H and J of the District's Climate Change Action Plan (CCAP) and believes the following ideas should be discussed in the development of CEQA guidance process.

Currently available technology does not meet AB-32 required reductions. To meet AB-32, the state must make significant investment in new energy efficiency and GHG reduction research and development (R&D). Significance thresholds need to

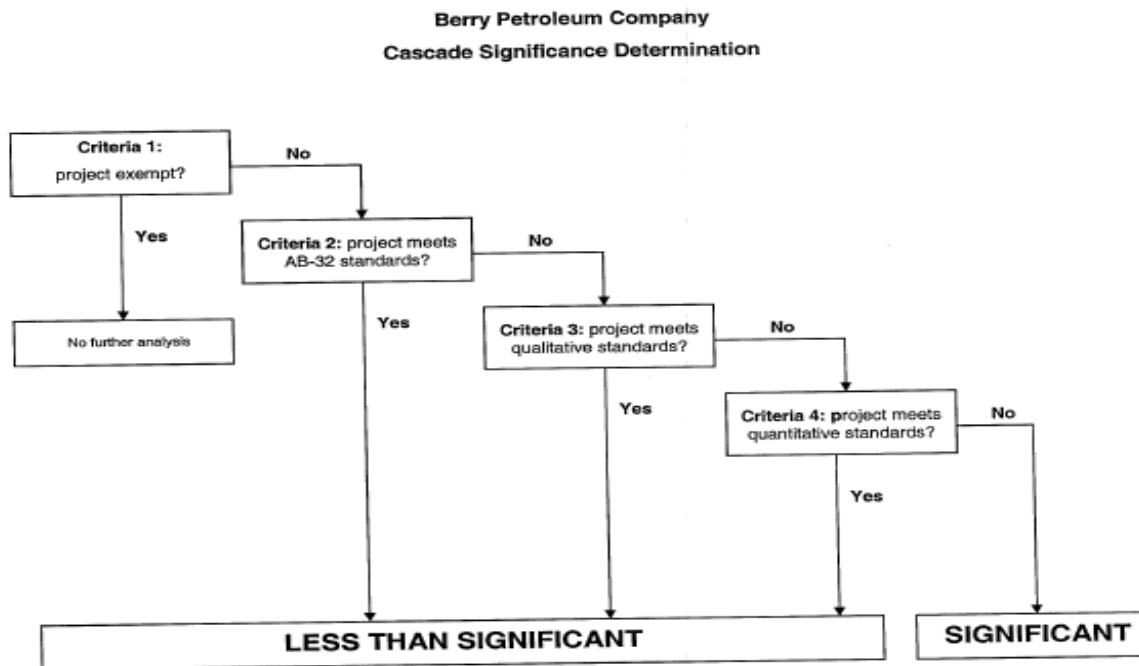
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May 5, 2009

credit R&D projects for successful new technologies. New technology cannot replace existing operations until R&D proves the technology. Without crediting new technology for the future impacts, approving R&D projects will require greater expense to mitigate temporary increases, even though the projects will eventually lead to significant reductions. Therefore, unless District significance threshold policy removes the disincentives to GHG reductions and energy efficiency R&D projects, the lead agency will not assure projects conform to all public plans and policy, as required by the Governor's Office of Public Research guidance.

Additionally, individual project that can meet AB-32 required reduction will result in a reduction in sector GHG emissions. Therefore, individual projects in compliance with AB-32 required reduction should not require additional analysis under CEQA.

Qualitative thresholds in the form of performance standards are available in most or all sectors and can be supported from a technical standpoint. Therefore, individual projects in compliance with the qualitative thresholds should not require additional analysis under CEQA.

Currently there is no legitimate scientific basis showing what quantitative thresholds of CEQA GHGs have a significant impact on climate change. Therefore, quantitative thresholds could be used to determine significance when legitimate science is made, but should be considered a minor criterion for determining significance of project.



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Appendix G: CEQA GHG Guidance Mitigation Measures Subcommittee (March 4, 2009)

Climate Change Action Plan
GHG CEQA Technical Workgroup—Mitigation Measures
March 4, 2009

CEQA GHG Guidance Mitigation Measures Subcommittee

March 4, 2009

The District has actively sought input from the ad hoc committee and the following document is still under development. The District is still receiving comments from the committee, which will be considered before finalizing this draft document.

Ad Hoc Committee Members

Bettina Arrigoni, Daniel Barber, John Beckman, David Campbell, Donna Carpenter, Dennis J. Champion, Tin Cheung, Dawn S. Chianese, Casey Creamer, Caroline Farrell, Jerry Frost, Wendy Garcia, Issac A. George, Spencer Hammond, Erin Burg Hupp, Sarah Jackson, Bob Keenan, Julia Lester, John Ludwick, Arnaud Marjollet, Michael B. McCormick, Mark Montelongo, James Mosher, Gordon Nipp, Elena Nuno, Tonya Short, Patia Siong, David Smith, Lee Smith, Dennis Tristao, Tom Umenhofer, Lisa Van De Water, and Nicole Vermilion.

See Appendix A

Climate Change Action Plan
GHG CEQA Technical Workgroup—Mitigation Measures
March 4, 2009

Introduction

Per CEQA Guidelines, when project related impacts exceed a significance threshold the lead agency is required to impose all feasible mitigation measures. Environmental impacts from GHG emissions are global in nature and unlike environmental impacts from criteria pollutants may be mitigated through non-traditional measures. During the Greenhouse Gas (GHG) California Environmental Quality Act (CEQA) Guidance Technical Workgroup meeting an ad hoc committee was formed to provide guidance/recommendations regarding mitigation of project specific GHG emissions during the CEQA environmental review process. To facilitate discussion, the District asked subcommittee members to share their views for addressing the following questions:

Key discussion topics considered by the ad hoc committee include:

7. Should GHG mitigation be geographically limited to measures that occur within the District, within the State of California, or the United States?
8. How would a lead agency evaluate mitigation measures consisting of GHG emission reduction credits purchased from a firm selling carbon credits?
9. How would a lead agency evaluate mitigation measures consisting of GHG emission reduction activities achieved by their company outside the project area?
10. How would a lead agency determine that GHG emissions have been mitigated to less than significant if the significance threshold consists solely of a performance standard?
11. How would a lead agency determine that GHG emissions have been mitigated to less than significant if the significance threshold consists of both a performance standard and a numerical value?

Conference calls were held on February 20 and 25, 2009. The following summarizes the committee's progress.

- 7. Should GHG mitigation be geographically limited to measures that occur within the District, within the State of California, or the United States?*

The committee recognizes that mitigation measures which reduce GHG emissions can also have collateral benefits on local air quality, i.e. implementation of solar panels can reduce emissions of criteria pollutants, by reducing fossil fuel consumption. The committee suggests that lead agencies preferentially implement local GHG mitigation measures. However, global climatic change results from the individual and cumulative impacts of project related GHG emissions and any reduction in GHG emissions would serve to mitigate project related global climatic change. The committee acknowledges the need for project proponents to have flexibility to seek the most cost effective measures for reducing project related GHG impacts. The committee does not support geographical limitations on GHG mitigation measures.

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8. How would a lead agency evaluate mitigation measures consisting of GHG emission reduction credits purchased from a firm selling carbon credits?

Carbon credits enable individuals and businesses to mitigate GHG emissions by offsetting, reducing or displacing the GHG emissions in another place, typically where it is more economical to do so. Carbon credits typically include renewable energy, energy efficiency and reforestation projects. Carbon credits can currently be purchased from several businesses, and more are likely to develop to match the demand for carbon credits. A key consideration of the use of carbon credits as mitigation is enforceability. Per CEQA Guidelines §15126.4(a)(2) mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instrument. The California Climate Action Registry and The Climate Registry have established lists of organizations to serve as verification bodies, providing GHG verification services. The American National Standards Institute (ANSI) is administering a GHG validation/verification body accreditation entity program under ISO 14065. The committee suggests that lead agencies limit use of carbon credits to credits which have been verified by an accredited organization, or to those accredited by the California Resources Board, or otherwise approved by the District.

9. How would a lead agency evaluate mitigation measures consisting of GHG emission reduction activities achieved by their company outside the project area?

The committee acknowledges that larger companies may have facilities outside the project area and can implement corporate-wide GHG reduction measures that could be used to offset project specific emissions. However, the committee acknowledges that it would not be feasible for a lead agency to verify emission reductions that occur outside their jurisdiction. The committee acknowledges that the responsibility for demonstrating adequacy of GHG emission reductions resides with the project proponent. The committee suggests that lead agencies limit mitigation to measures which have been verified by an accredited organization, or to those accredited by the California Resources Board, or otherwise approved by the District. The committee is optimistic that local verification will be more cost effective, thus, encouraging project proponents to initiate local GHG emission reductions.

10. How would a lead agency determine that GHG emissions have been mitigated to less than significant if the significance threshold consists solely of a performance standard?

The committee acknowledges that performance standards for development projects may not be as precise as performance standards established for stationary sources subject to air district permit requirements. For development projects, the committee suggests quantification of the emission reductions that would be achieved by a specific element within the performance standard and require mitigation that would

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achieve an equivalent reduction. For example, if the performance standard was to exceed Title 24 energy requirements by 30 percent and the project proponent exceeded Title 24 by 20 percent, they would be accountable for mitigating the amount of GHG emissions attributable to the 10 percent shortfall.

For stationary source projects subject to performance standards established by the District, ARB, or other applicable government agency, the committee considered compliance with a performance standard mandatory. This concept is consistent with current permitting activities that would require compliance with Best Available Control Technology (BACT).

11. How would a lead agency determine that GHG emissions have been mitigated to less than significant if the significance threshold consists of both a performance standard and a numerical value?

Resolution of this question is dependent upon whether the project proponent has the option of complying with either standard, or whether the project proponent must comply with both standards. If the project proponent has the option of complying with either standard and does not meet either standard, then it is plausible that the lead agency has the discretionary authority to require mitigation to the standard of their choice. Determining if the project had been mitigated to less than significant would follow the approach discussed above for development and stationary source projects.

If the project proponent has to comply with both standards, then determining if the project had been mitigated to less than significant would require demonstration that mitigation was equivalent to both standards, using approaches discussed above.

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Appendix A

Ad hoc Subcommittee Members:

Name	Affiliation
Bettina Arrigoni	Global Energy Partners, LLC
Dan Barber	SJVAPCD
John Beckman	Building Industry Assoc. of the Delta
David Campbell	Tricor
Donna Carpenter	Sikand Engineering
Dennis Champion	Occidental of Elk Hills
Dawn S. Chianese	Environ
Tin Cheung	The Planning Center
Casey Creamer	California Cotton Ginners
Caroline Farrell	Center on Race, Poverty & Environment
Jerry Frost	Kern Oil
Wendy Garcia	Constellation Wines
Issac A. George	City of Arvin
Spencer Hammond	Chevron
Erin Burg Hupp	Attorney at Law-Meyers Nave
Sarah Jackson	Earth Justice
Bob Keenan	HBATK
Julia Lester	Environ
John Ludwick	Berry Petroleum Company
Arnaud Marjollet	SJVAPCD
Michael B. McCormick	PMC
Mark Montelongo	SJVAPCD
James P. Mosher	CO ₂ & Energy
Gordon Nipp	Kern-Kaweah Chapter of Sierra Club
Elena Nuno	Michael Brandman Assoc.
Tonya Short	HBA of Kern County
Patia Siong	SJVAPCD
David Smith	DMD Associates
Lee Smith	Attorney-Stoel Rives
Dennis Tristao	J.G. Boswell Company
Tom Umenhofer	Western States Petroleum Association
Lisa Van de Water	SJVAPCD
Nicole Vermilion	The Planning Center

Staff Report

Appendix H:
Responses to Comments
(May 5, 2009)

SUMMARY OF SIGNIFICANT COMMENTS RECEIVED FROM WORKSHOP HELD MAY 5, 2009

Climate Change Action Plan: Addressing Greenhouse Gas Emissions Under the California Environmental Quality Act

Stakeholders providing comments:

- Center on Race, Poverty & Environment (CRPE)
- Environmental Justice for Catholic Charities of Stockton (EJCCS)
- City of Fresno (COF)
- Earth Justice (EJ)
- Stoel Rives (SR)
- LSA Associates (LSAA)
- Sacramento Metropolitan Air Quality Management District (SMAQMD)
- Sierra Club (SC)
- Southern California Gas Co. (SCGC)
- R.F. Macdonald Co. (RFMC)
- Arthur Unger (private individual; AU)
- Building Association of Central California/ Home Builders Association of Tulare & Kings Counties, Inc./ Building Industry Association of Fresno & Madera Counties, Inc. (altogether BIACC)
- Building Industry Association of the Delta (BIAD)
- California Cotton Ginners & Growers Association (CCGGA)
- Community Alliance for Responsible Environmental Stewardship (CARES)

AB 32

1. **Comment:** Expresses no confidence in the 29% reduction laid out in AB32. Strongly feels the 29% was a political compromise to get the legislation passed. Comments included that there is no scientific basis behind the percentage. (CRPE)

Response: AB32 does not specify a percentage reduction. It requires ARB to adopt a statewide GHG emissions limit to be achieved by 2020. The 29% number was identified in ARB's Scoping Plan (stated as "approximately 30%"). The 29% GHG emissions reduction is based on the emissions difference from the projected 2020 GHG Business-as-usual emissions to the 1990 GHG emissions level as presented in ARB's Scoping Plan. Data collected by ARB in supporting the establishment of the 1990 and 2020 emissions are provided as appendixes to the Scoping Plan and can also be found on ARB's website at <http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm>.

2. **Comment:** AB32 states: “Ensure that activities undertaken to comply with regulation not disproportionately impact low income communities. Must consider the potential for direct/indirect and cumulative emission impacts, including localized impacts in communities that are already adversely impacted by air pollution.” Strongly advises the District to take a closer look into disadvantaged communities. (EJCCS)

Response: District’s implementation on GHG will be consistent with District’s Environmental Justice policy.

Timeline

3. **Comment:** Based on the District’s implementation timeline, how will the District comply with OPR’s guidance and ARB’s guidance as they’re made available? (CRPE)

Response: The District will adjust its guidance, if necessary, to be consistent with rules or regulations that may be adopted.

4. **Comment:** What are other air districts in the state doing? Since the SJVAPCD can’t wait for ARB to draft guidance on GHG in CEQA.(EJCCS)

Response: The staff report presents a summary of what other air districts and agencies are doing to address GHG in regards to CEQA.

Best Performance Standards

5. **Comment:** How will “best performance standards” meet the targets laid out in the Staff Report? (CRPE)

Response: Chapters 4 and 5 of the current staff report include a discussion about quantification of GHG emission reductions for each Best Performance Standard.

6. **Comment:** What criteria will go into developing best performance standards? Each type of criteria needs to be supported by substantial evidence. (CRPE)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards,

7. **Comment:** If “best performance standards” are adopted, will the District allow local land use agencies to adopt or modify their own lists as well? Because there may be things that a big city can do, and a small city can’t. But again, projects need to be given credit. (COF)

Response: CEQA Guidelines clearly give lead agencies the discretion to adopt their own thresholds of significance. The District proposed guidance is offered to assist lead agencies in establishing their own thresholds of significance.

8. **Comment:** Will there be more details on what “best performance standards” are? And how are they developed? (EJ)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards

9. **Comment:** Will there be industry input on developing the best performance standards? (CCG)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including the process for public input.

10. **Comment:** There are concerns over the approach that projects meeting Best Performance Standards don't need to quantify GHG emissions. Nothing has been seen to support “not” having to quantify GHG emissions. (LSAA)

Response: As presented in Chapter 4, GHG emission reductions have been quantified for each Best Performance Standard. Project specific GHG emissions would require quantification if the project does not meet Best Performance Standards, or if an Environmental Impact Report is required for the project.

11. **Comment:** As the District comes up with best performance standards, will the SJVAPCD analyze their estimated quantitative mitigative effects and seek to achieve 29% mitigation from all projects? (SMAQMD)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including quantification of GHG emission reductions associated with each proposed Best Performance Standards.

12. **Comment:** Projects that will produce GHG beyond 2020 will need stricter mitigations so that they comply with AB 32 goals for future years. I presume that “Best Performance Standards” would lower GHG impacts at least as much as does conforming to AB 32. (AU)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including revision as necessary to be consistent with rules or regulations that may be adopted in the future.

13.Comment: BIACC agrees with the District that any CEQA GHG threshold proposal must preserve a lead agency's discretion to consider the context of a particular project when evaluating how best to assess and, if appropriate, mitigate a project's GHG emissions. The staff report also properly recognizes that the baseline for evaluation of a project's GHG impacts is the existing environmental setting. The staff report also properly recognizes that a project's compliance with applicable local, regional or statewide GHG reduction plans is critical to evaluating the project's impacts. As the Office of Planning and Research recognizes in their proposed language for CEQA regulations for GHG, a lead agency's evaluation of a project's impacts on climate change should pay particular attention to a project's contribution towards overall reduction of the state's or region's carbon footprint. (BIACC)

Response: Support for the District's proposal is noted.

14.Comment: We agree that several options exist for establishing qualitative thresholds; however we also note that several of the options listed in the Staff Report are not mutually exclusive. Specifically, evaluating GHG emissions reductions on a per capita per unit basis should be done using a percent reduction compared to business as usual approach. (BIACC)

Response: Comment noted.

15.Comment: We know that the statewide goal of reducing greenhouse gas emissions levels to 1990 levels is "specified in law" through AB32, and constitutes an adopted mitigation plan or program under this Guideline. SB 375 Sustainable Communities Strategies and other applicable local and regional GHG reduction plans will also qualify. (BIACC)

Response: Comment noted.

16.Comment: We generally agree with the approach illustrated in Table 2, under which a project can demonstrate that its' GHG emissions are less than significant if it reduces project emissions 29% below business as usual ("BAU"). (BIACC)

Response: Support for the District's proposal is noted.

17.Comment: We strongly disagree with the conclusion in the narrative staff report, which states that all projects permitted by the District will be required to implement a specific set of best performance standards, regardless of whether a project can separately demonstrate that it complies with an existing GHG reduction plan or that it has reduced GHG emissions reductions goal, which is not supported by existing CEQA statute or case law. Instead, projects that cannot reduce their GHG emissions 29% reduction below BAU should be

given the option to implement best performance standards or demonstrate equivalent reductions. But a single project should not be required to do both for its GHG emissions to be considered less than significant. (BIACC)

Response: The District concurs and has modified the proposed guidance to recognize compliance with an approved GHG emission reduction plan that is supported by a certified CEQA environmental review document. Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including demonstration of equivalency.

18.Comment: We strongly question the District's authority to require projects, at this time, to achieve GHG emissions reductions beyond a fair share of those contained in AB 32. (BIACC)

Response: The proposed guidance is consistent with authority granted to lead agencies under CEQA to reduce project related environmental impacts to less than significant by implementation of all feasible mitigation measures,

19.Comment: BIACC supports the development of best performance standards as one option for demonstrating less than significant GHG emissions. Furthermore, we believe the District can serve a critical role by acting as a resource or clearinghouse for feasible mitigation measures that project proponents can consider when developing their projects and possible GHG mitigation strategies. (BIACC)

Response: Support for the District's proposal is noted.

20.Comment: BIAD endorses the concept of Best Performance Standards as one method for determining the significance of a project. We agree with the analysis performed by the District in deciding upon BPS as an acceptable methodology and look forward to continuing our work with the District to establish BPS with flexibility and specificity. We also look forward to the District reducing the regulatory burden of this program by streamlining the process as discussed in the workshop on May 5th. We believe it is critical for this streamlining process to take contemporaneously with the adoption of the threshold for level of significance. (BIAD)

Response: Support for the District's proposal is noted.

21.Comment: We appreciate the District's recognition of SB 375 and the Sustainable Community Strategy Plans (SCPS) to be adopted by local agencies. We strongly believe that compliance with SB 375 and a locally adopted SCSP should also stand alone as a determination of significance for GHG under CEQA. (BIAD)

Response: Comment noted.

22. Comment: The District on the matter of quantitative reductions for determining level of significance chose to abstain from embracing the analysis used in the initial adoption of AB32. The California Global Warming Solutions Act of 2006 was established with quantitative goals for the state to achieve in 2020 and 2050. The quantitative goals of AB32 were not chosen randomly or arbitrarily but rather based in part on the Kyoto Protocols and extensive scientific studies on global warming. (BIAD)

Response: The District believes that the proposed guidance and recommendations are consistent with AB32.

23. Comment: BIAD supports the quantitative analysis found in AB32 setting the quantitative reduction of GHG at 29% below Business As Usual (BAU) as the proper target to achieve the goals and objectives of AB32. This numeric threshold should, independently and apart from compliances with BPS established by the District or SCSP established by local agencies satisfy the level of significance threshold for GHG under CEQA. (BIAD)

Response: As presented in the staff report, the District is unaware of scientific data supporting a numerical significance threshold.

24. Comment: By allowing a project applicant to choose between three equally valid methods of determining level of significance: 1) compliance with a local, regional or statewide plan to reduce GHG emissions such as a SCSP; 2) reducing project GHG emissions 29% below BAU; or 3) compliance with District adopted BPS, the District will be maintaining a flexible and workable regulatory system in furtherance of the objectives of AB32. BIAD would support regulations allowing a project to be deemed less than significant upon determination they have complied with any one of these three methods. (BIAD)

Response: The District has modified the proposed guidance to recognize compliance with an approved GHG emission reduction plan that is supported by a certified CEQA environmental review document.

25. Comment: The current draft suggests a Best Performance Standard (BPS) approach, but does not specify what is a best performance standard. (CCGGA)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including a definition of Best Performance Standards.

26.Comment: The District needs to take into account that emissions for all new projects have already been accounted for in ARB 2020 “business as usual” inventory and the Scoping Plan is a feasible mitigation approach. (CCGGA)

Response: District’s proposed process does take into account the emission reductions that have been achieved since the 2002-04 emissions baseline.

27.Comment: The District needs to be aware that new facilities and new projects will be subject to a considerable amount of double counting due to overlapping regulations. This will put new facilities at a disadvantage compared with an existing facility. A new facility will have to comply with the Best Performance Standard and then also reduce emissions according to the Cap-and-Trade program. Existing facilities will only have to comply with the Cap-and-Trade. This is yet another reason why ARB Scoping Plan needs to be considered feasible mitigation. (CCGGA)

Response: The District recognizes that there is the potential for overlap, however, OPR in its proposed amendments to CEQA Guidelines has clarified that compliance with AB32 alone is not sufficient to support a determination of significance.

28.Comment: New project’s need to have the ability to use offsets in lieu of meeting the yet undefined Best Performance Standard is an important economic factor. We appreciate that the District has added this flexibility into the Climate Change Action Plan and strongly believe that it needs to be preserved. Industries need flexibility and the ability to purchase offsets achieves gives new projects that flexibility. (CCGGA)

Response: Support for the District’s proposal is noted.

29.Comment: It was said the District would consider local agencies plan to be a best practice standard, would advice “caution” on that. As all general plans in the Valley have been done, none has had a finding that this is “absolute” best arrangement in land uses/transportation for reducing GHG. Maybe as agencies are asked to amend the land use design and circulation element improvements can be better than what’s been adopted, a land use plan shouldn’t be considered to be sufficient. (COF)

Response: The proposed guidance to land use agencies is consistent with amendments to CEQA Guidelines proposed by OPR.

30.Comment: Performance standards won’t reduce GHG emissions. Each performance standard needs to be measureable. (EJCCS)

Response: Chapters 4 and 5 of the current staff report include a discussion about quantification of GHG emission reductions for each Best Performance Standard.

- 31. Comment:** It is important that the District's CEQA guidance does not render moot AB 32's market based systems that could overcome the significant economic feasibility issues of certain dairy manure management projects that could not only reduce GHG emissions but could provide an important source of renewable energy. It is crucially important that the "best performance standards" for dairy operations be established so that the ability of a dairy to voluntarily implement additional projects that could further reduce GHG emissions through a market based cap and trade system is not compromised. (CARES)

Response: The proposed guidance does not require dairy operators to implement Best Performance Standards. It provides a means for streamlining the significance review process. Project proponents not implementing Best Performance Standards are required to quantify project related GHG emissions and demonstrate that they have reduced or mitigated project related GHG emissions by 29%.

- 32. Comment:** If the District establishes "best performance standards," that are in effect requirements to apply mitigation measures, the District essentially requiring a project to implement specified mitigation measures or to otherwise mitigate BAU emission by 29% in order to avoid a significance finding. This would be inconsistent with the intent that the District has emphasized during the working group process. It is also inconsistent with CEQA since a project's impacts must first be determined to be significant before feasibly mitigation may be required. (CARES)

Response: The proposed guidance does not require implementation of Best Performance Standards. It provides a means for streamlining the significance review process. Project proponents demonstrating that they have reduced or mitigated project related GHG emissions by 29% can conclude that project related impacts are not individually or cumulatively significant. As presented in the staff report, the District believes that a significance determination based on use of performance based standards is consistent with amendments to the CEQA Guidelines proposed by OPR.

- 33. Comment:** The District is encouraged to specify Best Performance Standards and quantify the percentage GHG reduction associated with each standard. Such quantification should be supported by substantial evidence. (SC)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including

quantification of GHG emission reductions for each Best Performance Standard.

Business-As-Usual Emissions

34. Comment: The District's plan needs to reveal specific details on "business as usual." (SC)

Response: Chapter 3 of the current staff report includes a discussion about Business-as-Usual (BAU) that clarifies BAU, as determined by ARB, represents a level of emissions from an emissions category and does not represent operational activities or processes.

35. Comment: How does "business as usual" relate to new projects? (EJ)

Response: Chapter 3 of the current staff report includes a discussion about Business-as-Usual (BAU) that clarifies BAU, as determined by ARB, represents a level of emissions from an emissions category and does not represent operational activities or processes.

36. Comment: The District needs to spell out what "business as usual" really is. If not, it will lead to abusive practices among consultants. (SC)

Response: Chapter 3 of the current staff report includes a discussion about Business-as-Usual (BAU) that clarifies BAU, as determined by ARB, represents a level of emissions from an emissions category and does not represent operational activities or processes.

Greenhouse Gas Reductions

37. Comment: Can thoughts be shared on criteria vs. GHG reduction? How to avoid being technology specific? How to avoid double counting? How is the District going to maintain fuel neutrality? (SCGC)

Response: Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including quantification of GHG emission reductions associated with each proposed Best Performance Standards. The proposed guidance is consistent with the District's traditional role of regulating sources of criteria pollutants to protect public health.

38. Comment: How will the District approach a project's total emissions? Then assume a 29% reduction, and in relation be able to show the actual project emission reductions. (EJ)

Response: As presented in Chapter 4, project specific GHG emissions would require quantification if the project does not meet Best Performance Standards, or if an Environmental Impact Report is required for the project. The proposed guidance is consistent with CEQA Guidelines proposed by OPR.

- 39. Comment:** Anything the District does for providing guidance with GHG in CEQA, needs to be consistent with existing CEQA law. (CRPE)

Response: The proposed guidance is consistent with CEQA Guidelines proposed by OPR.

- 40. Comment:** It is encouraged that the District evaluates real quantifiable emissions and not life cycle emissions that are not quantifiable. (COF)

Response: OPR has provided clarification that lifecycle quantification is not required. District's policy is consistent with that recommendation.

- 41. Comment:** CEQA provides a tool called "Certified Regulatory Program," it allows people to enter a program and be certified to achieving a certain level of reductions. This takes the burden off lead agencies and applicants. (COF)

Response: The District has modified the proposed guidance to recognize compliance with an approved GHG emission reduction plan that is supported by a certified CEQA environmental review document.

- 40. Comment:** Dairy families throughout the San Joaquin Valley will be undertaking significant voluntary efforts to reduce their greenhouse gas emissions in a market based cap and trade system. It is crucially important that the SJVAPCD's guidance does not inadvertently destroy the "voluntariness" of those efforts, and thus the economic feasibility of implementing those projects. (CARES)

Response: The proposed guidance does not require implementation of Best Performance Standards. It provides a means for streamlining the significance review process. Project proponents demonstrating that they have reduced or mitigated project related GHG emissions by 29% can conclude that project related impacts are not individually and cumulatively significant. As presented in the staff report, the District believes that a significance determination based on use of performance based standards is consistent with amendments to the CEQA Guidelines proposed by OPR.

- 41. Comment:** Draft Staff Report contains no argument that the precise 29% value is the cutoff point between feasibility and infeasibility. The 29% cutoff point seems arbitrary. How does the District justify a 29% cutoff point if mitigation beyond that value is feasible? The final plan should include

substantial evidence supporting a specific cutoff point. The District should require reductions of GHG emissions beyond the 29% below BAU requirement in the Climate Change Action Plan. (SC)

Response: As presented in the staff report, existing science is inadequate to support a significance determination based on a precise evaluation of project related GHG emissions. The 29% emission reduction is not arbitrary, but it is consistent with the emission reduction target established by ARB in its AB 32 scoping plan, which is consistent with its legislative mandate pursuant to State adoption of AB32.

Miscellaneous

42.Comment: Streamlining needs more specifics. In relation, streamlining measures can lead to projects getting tied into litigation. (SC)

Response: Chapters 4 and 5 of the staff report have been expanded to include additional implementation details. It is the District's intent to develop guidance and tools to streamline the implementation of the process.

43.Comment: More time will be needed to review the information as it's made available before the next workshop. (EJ)

Response: The request is consistent with the District's intent. The goal is to post all documents two weeks prior to the next workshop scheduled for June 30, 2009.

44.Comments: Will meeting minutes and participants be made available? (RFMC)

Response: Available District documents can be found on the Districts website at http://www.valleyair.org/Programs/CCAP/CCAP_idx.htm.

45.Comments: What is the definition of a project- New? Existing? Constructing? (RFMC)

Response: For the proposed guidance, the term "project" has the same meaning as defined in CEQA Guidelines. .

46.Comments: Will any new fee be associated with this new GHG in CEQA implementation? (RFMC)

Response: The proposed guidance is intended to assist the District, lead agencies, and the public in addressing CEQA requirements and it does not propose new fees.

47. Comments: For final draft, is a socio-economic analysis going to be performed that will address potential “leakage.” (RFMC)

Response: By law, District staff is required to perform a socioeconomic impact analysis prior to adoption, amendment, or repeal of a rule that has significant air quality benefits or that will strengthen emission limitations. The proposed guidance serves only as recommendations and is not a District rule. Therefore, a socio-economic analysis is not required.

48. Comment: The District should consider a tier for industrial projects consistent with the tier for transportation and development projects that allows a project that is consistent with requirements of an approved state, regional or local regulations or plan that includes a GHG analysis. The District should not rule out the possibility that a project’s GHG emissions may have an insignificant impact on the environment in the absence of the use of “best performance standards” or 29% emission reductions below BAU. (CARES)

Response: The District concurs and has modified the proposed guidance to recognize compliance with an approved GHG emission reduction plan that is supported by a certified CEQA environmental review document. Chapters 4 and 5 of the current staff report include a discussion about methodology for developing Best Performance Standards, including demonstration of equivalency.

49. Comment: The Draft Staff Report is deficient in that it does not present scientifically based evidence that a project deemed “Less Than Significant” under the regimen presented in Table 2 or Table 3 would not still have a significant effect on global climate change. (SC)

Response: As presented in the staff report, the existing science is inadequate to support a determination that project specific GHG emissions, regardless of the amount, would or would not have a significant impact on global climatic change. As presented in the current staff report the District has evaluated the various options for determining the significance of project related impacts.

50. Comment: Many facets of the Climate Change Action Plan, including the notions of BPS and BAU, are so vague as to invite litigation. Final CCAP should contain specific and precise details. (SC)

Response: The staff report has been revised to provide additional information regarding BPS and BAU.

Final Draft Staff Report

Appendix I:

Best Performance Standards Stationary Source Projects

Best Performance Standards (BPS) for: GHG Emissions From Stationary Sources		
Emission Unit or Operation	BPS	Approved Alternate Technology
Fossil Fuel-Fired Boilers, Steam Generators & Process Heaters With Firing Capacity > 5 MMBtu/hour (HHV)	<p>All units shall utilize gaseous fuel only and be appropriately sized and/or have adequate load following capability to avoid the venting of steam to the atmosphere except during emergency situations or during specifically identified and limited maintenance or startup/shutdown operations. In addition, each unit shall meet at least one of the two following criteria:</p> <ol style="list-style-type: none"> 1. The unit shall be designed for a minimum thermal efficiency of 95 % and shall utilize variable frequency drive electric motor on combustion air/FGR fans or, 2. The unit shall be designed for maximum thermal efficiency by incorporating all of the following design features: a) install adequate heat transfer surface to provide a maximum design approach of 20 oF between the stack gas temperature and the process inlet temperature, b) limit the use of flue gas recirculation (FGR) for NOx control to no more than 10 % , c) minimize excess air in combustion by maintaining a maximum O2 concentration of 3 volume percent in stack gas and d) use variable frequency drive electric motor on combustion air/FGR fans 	<ol style="list-style-type: none"> 1. Install equipment utilizing solar energy source in lieu of fossil fuel 2. Obtain GHG emission performance equivalent to BPS by recovery and permanent sequestration of CO₂ from the exhaust of the unit 3. Utilize biogenic fuel derived from natural or waste sources in lieu of fossil fuel (biogenic fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria)
Non-Emergency Flares with rated heat release > 5 MMBtu/hour (HHV)	Combustion shall be performed in an alternate device in lieu of a flare which produces useful energy which would have otherwise been required (utilized as fuel in an engine, boiler, turbine or delivered to a natural gas pipeline, etc.) where the proposed operation is non-emergency. Emergency flares shall utilize a flow-sensing ignition device rather than a continuous pilot and non-GHG purge gas	Obtain GHG emission performance equivalent to BPS by recovery and permanent sequestration of CO ₂ from the exhaust of the unit

Emission Unit or Operation	BPS	Approved Alternate Technology
<p>Non-Emergency Onsite Electric Power Generation with Fossil Fuel Combustion > 5 MMBtu/hour Or With Fossil Fuel-Fired Mechanical Driver > 50 bhp</p>	<p>Electric power supply shall be provided solely by a PUC-licensed electric utility in lieu of a fossil fuel-fired unit except for facilities meeting any of the following criteria:</p> <ol style="list-style-type: none"> 1. Emergency standby power generation, or 2. Power generation from a cogeneration unit 	<ol style="list-style-type: none"> 1. Utilize solar energy source in lieu of firing fossil fuels 2. Obtain GHG emission performance equivalent to BPS by recovery and permanent sequestration of CO₂ from the exhaust of the unit 3. Utilize biogenic fuel derived from natural or waste sources in lieu of fossil fuel (biogenic fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria)
<p>Non-Emergency Mechanical Equipment Driver (requirement in lieu of reciprocating IC engines > 50 hp and combustion turbines > 3 MMBtu/hour excluding combustion turbines in cogeneration service)</p>	<p>A non-emergency mechanical equipment driver shall consist of an electric motor, in lieu of a fossil fuel-fired unit, with energy efficiency meeting the efficiency criteria for Premium Efficiency Electric Motors as specified in the National Electrical Manufacturer's Association (NEMA) Standard MG-1 or, upon District approval of submitted documentation which corroborates a claim by the applicant that such electric motor is not feasible, applicant may install a motor with efficiency equal to the maximum available for the proposed class of motor.</p>	<ol style="list-style-type: none"> 1. Power equipment using a renewable energy source such as solar or wind in lieu of fossil fuel 2. Utilize biogenic fuel derived from natural or waste sources in lieu of fossil fuel (biogenic fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria)

Emission Unit or Operation	BPS	Approved Alternate Technology
Fossil Fuel-Fired Cogeneration (combustion turbines > 3 MMBtu/hr or other combustion devices > 5 MMBtu/hour)	Fossil fuel fired cogeneration systems shall be designed to achieve an incremental GHG emission rate not exceeding 700 lb- CO ₂ per MWh at the system's design operating point based on power output at the generator terminals, assuming the process thermal demand could alternatively be met by direct fuel firing with 90% thermal efficiency. Heat recovery design shall maximize thermal efficiency by installing adequate heat transfer surface to provide a maximum 20 °F approach between stack gas temperature and the process inlet temperature	Utilize biogenic fuel derived from renewable natural or waste sources in lieu of fossil fuel (biogenic fuels derived from agricultural operations performed specifically for fuel production do not meet this criteria)
Landfill Operations	Landfills shall comply with CARB Regulation to Reduce Methane Emissions From Municipal Solid Waste Landfills. (www.arb.ca.gov/regact/2009/landfills09/isor.pdf)	None identified
Wastewater Treatment	Wastewater treatment facilities shall incorporate both of the following two control measures: 1. Sludge: Sludge shall be treated anaerobically in digesters, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment; and 2. Liquid Waste: At least 33% of electricity used for liquid waste aeration shall be derived from renewable energy sources, based on grid power Renewables Portfolio Standard (RPS), and/or supplementation of grid with onsite generation using renewable energy sources such as, but not limited to, biogas, biomass, solar, and wind.	1. Sludge: None identified 2. Liquid Waste: Liquid waste shall be treated anaerobically in digesters or covered ponds, with captured Methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment.

Emission Unit or Operation	BPS	Approved Alternate Technology
Oil And Gas Extraction, Storage, Transportation And Refining Operations	Fugitive Methane emissions shall be minimized by applying VOC Leak Standards, as contained in District Rules 4409 and 4455 to components handling methane	None identified
Direct-Fired Combustion Heat Transfer Equipment (Dryers, Kilns, etc)	Best Performance Standards for this category of equipment will be developed by the District in the future	
Farming Operations –Livestock rearing	<p>All operations shall utilize all three following control measures:</p> <ol style="list-style-type: none"> 1. All ruminant animal feed shall include at least 6% cottonseed, or, upon District approval, based on sufficient demonstration that use of cottonseed is not feasible, an equivalent substitute; and 2. Manure from animal housing areas for mature cows shall be removed and transferred into appropriate treatment facilities at least four times a day and at least once a day for all other animals; and 3. Collected manure shall be treated anaerobically in digesters or covered lagoons, with captured methane used for energy recovery in a method that displaces current or required fossil fuel use, such as, but not limited to, injection into natural gas pipeline, or powering mobile equipment 	None identified.
Farming Operations – Land application of manure	Manure shall be incorporated into soil within 24 hours after application	None identified.

Final Draft Staff Report

Appendix J:

**GHG Emission Reduction Measures -
Development Projects**

GHG Emission Reduction Measures						
MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
<u>Bicycle/Pedestrian/Transit Measures</u>						
1	Bike parking	C	M	?	0.625	Non-residential projects provide plentiful short-term and long-term bicycle parking facilities to meet peak season maximum demand. Short term facilities are provided at a minimum ratio of one bike rack space per 20 vehicle spaces. Long-term facilities provide a minimum ratio of one long-term bicycle storage space per 20 employee parking spaces.
2	End of trip facilities	C	M	?	0.625	Non-residential projects provide "end-of-trip" facilities including showers, lockers, and changing space. Facilities shall be provided in the following ratio: four clothes lockers and one shower provided for every 80 employee parking spaces. For projects with 160 or more employee parking spaces, separate facilities are required for each gender.
3	Bike parking at multi-unit residential	?	?	R	0.625	Long-term bicycle parking is provided at apartment complexes or condominiums without garages. Project provides one long-term bicycle parking space for each unit without a garage. Long-term facilities shall consist of one of the following: a bicycle locker, a locked room with standard racks and access limited to bicyclists only, or a standard rack in a location that is staffed and/or monitored by video surveillance 24 hours per day.
4	Proximity to bike path/bike lanes	C	M	R	0.625	Entire project is located within 1/2 mile of an existing Class I or Class II bike lane and project design includes a comparable network that connects the project uses to the existing offsite facility. Existing facilities are defined as those facilities that are physically constructed and ready for use prior to the first 20% of the projects occupancy permits being granted. Project design includes a designated bicycle route connecting all units, on-site bicycle parking facilities, offsite bicycle facilities, site entrances, and primary building entrances to existing Class I or Class II bike lane(s) within 1/2 mile. Bicycle route connects to all streets contiguous with project site. Bicycle route has minimum conflicts with automobile parking and circulation facilities. All streets internal to the project wider than 75 feet have class II bicycle lanes on both sides.
5	Pedestrian network	C	M	R	1	The project provides a pedestrian access network that internally links all uses and connects to existing external streets and pedestrian facilities. Existing facilities are defined as those facilities that are physically constructed and ready for use prior to the first 20% of the projects occupancy permits being granted.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
5a	Pedestrian Network	C	M	R	0.5	The project provides a pedestrian access network that internally links all uses for connecting to planned external streets and pedestrian facilities (facilities must be included pedestrian master plan or equivalent).
6	Pedestrian barriers minimized	C	M	R	1	Site design and building placement minimize barriers to pedestrian access and interconnectivity. Physical barriers such as walls, berms, landscaping, and slopes between residential and non-residential uses that impede bicycle or pedestrian circulation are eliminated. Barriers to pedestrian access of neighboring facilities and sites are minimized. This measure is not meant to prevent the limited use of barriers to ensure public safety by prohibiting access to hazardous areas, etc...
7	Bus shelter for existing transit service	C	M	R	0.5	Bus or Streetcar service provides headways of one hour or less for stops within 1/4 mile; project provides safe and convenient bicycle/pedestrian access to transit stop(s) and provides essential transit stop improvements (i.e., shelters, route information, benches, and lighting).
8	Bus shelter for planned transit service	C	M	R	0.25	Project provides transit stops with safe and convenient bicycle/pedestrian access. Project provides essential transit stop improvements (i.e., shelters, route information, benches, and lighting) in anticipation of future transit service. If measure 7 is selected, it excludes this measure.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description																																					
9	Traffic calming	C	M	R	see table in Measure Description	<p>Project design includes pedestrian/bicycle safety and traffic calming measures in excess of jurisdiction requirements. Roadways are designed to reduce motor vehicle speeds and encourage pedestrian and bicycle trips by featuring traffic calming measures. Traffic calming measures include: bike lanes, center islands, closures (cul-de-sacs), diverters, education, forced turn lanes, roundabouts, speed humps, etc.... Percent of Streets with Improvements</p> <table><tr><th rowspan="6">Percent of Intersections with Improvements</th><th colspan="6">Percent of Streets with Improvements</th></tr><tr><th>25%</th><th>25%</th><th>50%</th><th>75%</th><th>100%</th><th></th></tr><tr><td>0.25</td><td>0.25</td><td>0.25</td><td>0.5</td><td>0.5</td><td>0.5</td></tr><tr><td>0.25</td><td>0.25</td><td>0.5</td><td>0.5</td><td>0.75</td><td>0.75</td></tr><tr><td>0.5</td><td>0.5</td><td>0.5</td><td>0.75</td><td>0.75</td><td>0.75</td></tr><tr><td>1.0</td><td>0.5</td><td>0.75</td><td>0.75</td><td>1.0</td><td></td></tr></table>	Percent of Intersections with Improvements	Percent of Streets with Improvements						25%	25%	50%	75%	100%		0.25	0.25	0.25	0.5	0.5	0.5	0.25	0.25	0.5	0.5	0.75	0.75	0.5	0.5	0.5	0.75	0.75	0.75	1.0	0.5	0.75	0.75	1.0	
Percent of Intersections with Improvements	Percent of Streets with Improvements																																										
	25%	25%	50%	75%	100%																																						
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	1.0	0.5	0.75	0.75	1.0																																						

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
<u>Parking Measures</u>						
10	Paid parking	C	M	R	see below	Employee and/or customer paid parking system
10a	Paid Parking - Urban site within 1/4 mile from transit stop	C	M	R	5	Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.
10b	Paid Parking- Urban site greater than 1/4 mile from transit stop	C	M	R	1.50	Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.
10c	Paid Parking- Suburban site within 1/4 mile of transit stop	C	M	R	2	Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.
10d	Paid Parking- Suburban site greater than 1/4 mile from transit stop	C	M	R	1	Employee and/or customer paid parking system. Daily charge for parking must be equal to or greater than the cost of a local transit pass + 20%. Monthly charge for parking must be equal to or greater than the cost of a local monthly transit pass, plus 20%.
10e	Parking cash out	C	M		0.6	Employer provides employees with a choice of forgoing subsidized parking for a cash payment equivalent to the cost of the parking space to the employer.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
11	Minimum parking	C	M	R	3	Provide minimum amount of parking required. Special review of parking required. If zoning codes in the San Joaquin Valley area have provisions that allow a project to build less than the typically mandated amount of parking if the development features design elements that reduce the need for automobile use. This measure recognizes the air quality benefit that results when facilities minimize parking needs, and grants mitigation value to project that implemented all available parking reductions. Once land uses are determined, the trip reduction factor associated with this measure can be determined by utilizing the Institute of Transportation Engineers (ITE) Parking generation publication. The reduction in trips can be computed as shown below by the ratio of the difference of minimum parking required by code and ITE peak parking demand to ITE peak parking demand for the land uses multiplied by 50%. The maximum achievable trip reduction is 6%. For projects where retail space occupies 50% or more of the total built space, do not use December specific parking generation rates (from ITE). Percent Trip Reduction = 50*[(min parking required by code - ITE peak parking demand) / (ITE peak parking demand)].
12	Parking reduction beyond code	C	M	R	6	Provide parking reduction less than code. Special review of parking required. Recommend a Shared Parking strategy. Trip reductions associated with parking reductions beyond code shall be computed in the same manner as described under measure 11, as the same methodology applies. The maximum achievable trip reduction is 12%. This measure can be readily implemented through a Shared Parking strategy, wherein parking is utilized jointly among different land uses, buildings, and facilities in an area that experience peak parking needs at different times of day and day of the week. For example, residential uses and/or restaurant/retail uses, which experience peak parking demand during the evening/night and on the weekends, arrange to share parking facilities with office and/or educational uses, which experience peak demand during business hours and during the week.
13	Pedestrian pathway through parking	C	M	R	0.5	Provide a parking lot design that includes clearly marked and shaded pedestrian pathways between transit facilities and building entrances. Pathway must connect to all transit facilities internal or adjacent to project site. Site plan should demonstrate how the pathways are clearly marked, shaded, and are placed between transit facilities and building entrances.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
14	Off street parking	C	M	R	see below	Parking facilities are not adjacent to street frontage
14a	Off street parking	C	M	R	1.5	For 1.5% reduction, parking facilities shall not be sited adjacent to public roads contiguous with project site. Functioning pedestrian entrances to major site uses are located along street frontage. Parking facilities do not restrict pedestrian, bicycle, or transit access from adjoining uses. Proponent shall provide information demonstrating compliance with measure requirements including, but not limited to, a description of where parking is located relative to the buildings on the site, site plans, maps, or other graphics, which demonstrate the placement of parking facilities behind on-site buildings relative to streets contiguous with the project site. Surrounding uses should be high density or mixed-use, there shall be other adjoining pedestrian and bicycle connections, such as wide sidewalks and bike lanes, and surrounding uses shall also implement measure 15.
14b	Off street parking	C	M	R	1	For 1.0% reduction, (parking structures only) proponent must show that parking facilities that face street frontage feature ground floor retail along street frontage. Proponent shall provide information demonstrating compliance with measure requirements including, but not limited to, a written description of the parking facility and the amount of retail space on the ground floor, site plans, maps, or other graphics demonstrating the placement of retail/commercial space along all street fronts contiguous with parking structure.
14c	Off street parking	C	M	R	0.1	For 0.1% reduction, the project is not among high-density or mixed uses, is not connected to pedestrian or bicycle access ways, or is among uses that do not also hide parking. This point value is reflective of the importance that other pedestrian and density measures be in place in order for this measure to be effective.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
<u>Site Design Measures</u>						
15	Office/Mixed-Use proximate to transit	C	M	~	see below	Mitigation value is based on project density and proximity to transit. Planned transit must be in MTP or RT Master Plan. To count as "existing transit" service must be fully operational prior to the first 20% of the projects occupancy permits being granted. Project must provide safe and convenient pedestrian and bicycle access to all transit stops within 1/4 mile. Proponent shall provide information demonstrating compliance with measure requirements including, but not limited to, a written description of how the project complies with the measure, a map or graphic depicting the location of the project in relation to the transit stop. Graphic should demonstrate a 1/4 mile radius, arc, from transit and planned pathways and linkages to the transit stop. Proponent shall also provide graphics depicting the size and layout of the building as well as the calculations demonstrating the FAR (floor to area ratio).
15a	Office/Mixed-Use proximate to Planned Light Rail Transit	C	M	~	0.4	0.75-1.5 FAR (Floor to Area Ratio)
		C	M	~	0.5	1.5-2.25 FAR (Floor to Area Ratio)
		C	M	~	0.75	2.25 or greater FAR (Floor to Area Ratio)
15b	Office/Mixed-Use proximate to Planned Bus Rapid Transit	C	M	~	0.2	0.75-1.5 FAR (Floor to Area Ratio)
		C	M	~	0.25	1.5-2.25 FAR (Floor to Area Ratio)
		C	M	~	0.3	2.25 or greater FAR (Floor to Area Ratio)

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
15c	Office/Mixed-Use proximate to Existing Light Rail Transit	C	M	?	0.75	0.75-1.5 FAR (Floor to Area Ratio)
		C	M	?	1	1.5-2.25 FAR (Floor to Area Ratio)
		C	M	?	1.5	2.25 or greater FAR (Floor to Area Ratio)
15d	Office/Mixed-Use proximate to Existing Bus Rapid Transit	C	M	?	0.4	0.75-1.5 FAR (Floor to Area Ratio)
		C	M	?	0.5	1.5-2.25 FAR (Floor to Area Ratio)
		C	M	?	0.75	2.25 or greater FAR (Floor to Area Ratio)
16	Orientation toward existing transit, bikeway, or pedestrian corridor	C	M	R	0.5	Project is oriented towards existing transit, bicycle, or pedestrian corridor. Setback distance is minimized. Setback distance between project and adjacent uses is reduced to the minimum allowed under jurisdiction code. Setback distance between different buildings on project site is reduced to the minimum allowed under jurisdiction code. Setbacks between project buildings and sidewalks is reduced to the minimum allowed under jurisdiction code. Buildings are oriented towards street frontage. Primary entrances to buildings are located along public street frontage. Project provides bicycle access to existing bicycle corridor. Project provides access to existing pedestrian corridor. (Cannot get points for both this measure and measure 17)

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
17	Orientation toward planned transit, bikeway, or pedestrian corridor	C	M	?	0.25	Project is oriented towards planned transit, bicycle, or pedestrian corridor. Setback distance is minimized. Planned transit, bicycle or pedestrian corridor must be in the MTP, RT Master Plan, General Plan, or Community Plan. Setback distance between project and existing or planned adjacent uses is minimized or non-existent. Setback distance between different buildings on project site is minimized. Setbacks between project buildings and planned or existing sidewalks are minimized. Buildings are oriented towards existing or planned street frontage. Primary entrances to buildings are located along planned or existing public street frontage. Project provides bicycle access to any planned bicycle corridor(s). Project provides pedestrian access to any planned pedestrian corridor(s).
18	Residential Density With <u>No Transit</u>	?	?	R	see below	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.
-	3-6 Du/acre	?	?	R	0	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.
-	7-10 Du/acre	?	?	R	1	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
-	11-20 Du/acre	?	?	R	3	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.
-	21-30 Du/Acre	?	?	R	5	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.
-	31-40 Du/acre	?	?	R	6	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.
-	41-50 Du/acre	?	?	R	8	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.
-	50+ Du/acre	?	?	R	10	Project provides high-density residential development. Mitigation value is based on project density with no transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
18a	Residential density With Planned Light Rail Transit	?	?	R	see below	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	3-6 Du/acre	?	?	R	0	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	7-10 Du/acre	?	?	R	1.75	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	11-20 Du/acre	?	?	R	3.75	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
-	21-30 Du/Acre	?	?	R	5.75	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	31-40 Du/acre	?	?	R	6.75	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	41-50 Du/acre	?	?	R	8.75	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	50+ Du/acre	?	?	R	10.75	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
18b	Residential Density with Planned Bus Rapid Transit	?	?	R	see below	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	3-6 Du/acre	?	?	R	0	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	7-10 Du/acre	?	?	R	1.25	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	11-20 Du/acre	?	?	R	3.25	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
-	21-30 Du/Acre	?	?	R	5.25	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	31-40 Du/acre	?	?	R	6.25	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	41-50 Du/acre	?	?	R	8.25	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.
-	50+ Du/acre	?	?	R	10.25	Project provides high-density residential development. Mitigation value is based on project density and proximity to planned bus rapid transit . Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border. Planned transit must be in a MTP or RT Master Plan.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
18c	Residential Density with Existing Light Rail Transit	~	~	R	see below	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	3-6 Du/acre	~	~	R	0	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	7-10 Du/acre	~	~	R	2.5	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	11-20 Du/acre	~	~	R	4.5	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	21-30 Du/Acre	~	~	R	6.5	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
-	31-40 Du/acre	?	?	R	7.5	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	41-50 Du/acre	?	?	R	9.5	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	50+ Du/acre	?	?	R	11.5	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing light rail transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
18d	Residential Density with Existing Bus Rapid Transit	?	?	R	see below	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	3-6 Du/acre	?	?	R	0	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	7-10 Du/acre	?	?	R	2	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
-	11-20 Du/acre	?	?	R	4	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	21-30 Du/Acre	?	?	R	6	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	31-40 Du/acre	?	?	R	7	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	41-50 Du/acre	?	?	R	9	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.
-	50+ Du/acre	?	?	R	11	Project provides high-density residential development. Mitigation value is based on project density and proximity to existing bus rapid transit. Density is calculated by determining the number of units per acre ("du/acre") within the residential portion of the project's net lot area. Existing transit facilities must be within 1/4 mile of project border. Project provides safe and convenient bicycle/pedestrian access to all transit stop(s) within 1/4 mile of project border.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
19	Street grid	C	M	R	1	Multiple and direct street routing (grid style). The measure applies to projects with an internal connectivity factor (CF)>=0.80, and average of 1/4 mile or less between external connections along perimeter of project. [CF=# of intersections / (# of cul-de-sacs + intersections)]
20	Neighborhood Electric Vehicle access	C	M	R	see below	Make physical development consistent with requirements for neighborhood electric vehicles (NEV). Current studies show that for most trips, NEVs do not replace gas-fueled vehicles as the primary vehicle. For the purpose of providing incentives for developers to promote NEV use, assume the percent reductions noted below.
20a	Neighborhood Electric Vehicle access	C	M	R	1.5	For 1.5% reduction, a neighborhood shall have internal NEV connections and connections to other existing NEV networks serving all other types of uses.
20b	Neighborhood Electric Vehicle access	C	M	R	1	For 1.0% reduction, a neighborhood shall have internal and external connections to surrounding neighborhoods.
20c	Neighborhood Electric Vehicle access	C	M	R	0.5	For 0.5% reduction, a neighborhood has internal connections only.
21	Affordable Housing Component	~	~	R	see below	Residential development projects of 5 or more dwelling units provide a deed-restricted low-income housing component on-site (as defined in Ch 22.35 of Sacramento County Ordinance Code) [Developers who pay into In-Lieu Fee Programs are not considered eligible to receive credit for this measure]. Percent reductions shall be calculated according to the following formula: % reduction=% units deed-restricted below the market rate housing *0.04
21a	Affordable Housing Component	~	~	R	0.6	Reductions apply if 15% of units are deed-restricted below the market housing rate.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
21b	Affordable Housing Component	?	?	R	0.8	Reductions apply if 20% of units are deed-restricted below the market housing rate.
21c	Affordable Housing Component	?	?	R	1.2	Reductions apply if 30% of units are deed-restricted below the market housing rate.
21d	Affordable Housing Component	?	?	R	1.6	Reductions apply if 40% of units are deed-restricted below the market housing rate.
21e	Affordable Housing Component	?	?	R	2	Reductions apply if 50% of units are deed-restricted below the market housing rate.
21f	Affordable Housing Component	?	?	R	2.4	Reductions apply if 60% of units are deed-restricted below the market housing rate.
21g	Affordable Housing Component	?	?	R	2.8	Reductions apply if 70% of units are deed-restricted below the market housing rate.
21h	Affordable Housing Component	?	?	R	3.2	Reductions apply if 80% of units are deed-restricted below the market housing rate.

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
21i	Affordable Housing Component	?	?	R	3.6	Reductions apply if 90% of units are deed-restricted below the market housing rate.
21j	Affordable Housing Component	?	?	R	4	Reductions apply if 100% of units are deed-restricted below the market housing rate.
<u>Mixed-Use Measures</u>						
22	Urban Mixed-Use Measure	?	M	?	see below	Development of projects predominantly characterized by properties on which various uses, such as office, commercial, institutional, and residential are combined in a single building or on a single site in an integrated development project with functional inter-relationships and a coherent physical design. Mitigation points for this measure depend on job to housing ratio.
22a	Urban Mixed-Use Measure	?	M	?	3	Reductions apply if the ratio (jobs:houses) is $\geq .5 < 1.0$
22b	Urban Mixed-Use Measure	?	M	?	6.6	Reductions apply if the ratio (jobs:houses) is $\geq 1 < 1.5$
22c	Urban Mixed-Use Measure	?	M	?	9	Reductions apply if the ratio (jobs:houses) is $\geq 1.5 < 2.0$
22d	Urban Mixed-Use Measure	?	M	?	7.29	Reductions apply if the ratio (jobs:houses) is $\geq 2.0 < 2.5$

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
22e	Urban Mixed-Use Measure	?	M	?	6	Reductions apply if the ratio (jobs:houses) is $\geq 2.5 < 3.0$
22f	Urban Mixed-Use Measure	?	M	?	5	Reductions apply if the ratio (jobs:houses) is $\geq 3.0 < 3.5$
22g	Urban Mixed-Use Measure	?	M	?	4.2	Reductions apply if the ratio (jobs:houses) is $\geq 3.5 \leq 4.0$
23	Suburban mixed-use	C	M	R	3	Have at least three of the following on site and/or offsite within $\frac{1}{4}$ mile: Residential Development, Retail Development, Park, Open Space, or Office.
24	Other mixed-use	?	M	R	1	All residential units are within $\frac{1}{4}$ mile of parks, schools or other civic uses.
<u>Building Component Measures</u>						
25	Energy Star roof	C	M	R	0.5	Install Energy Star labeled roof materials. Energy star qualified roof products reflect more of the sun's rays, decreasing the amount of heat transferred into a building.
26	Onsite renewable energy system	C	M	R	1	Project provides onsite renewable energy system(s).
27	Exceed title 24	C	M	R	1	Project Exceeds title 24 requirements by 20%

MEASURE #	Measure Name	Commercial	Mixed-Use	Residential	Estimated CO ₂ Equivalent Point Reductions	Measure Description
28	Solar orientation	?	?	R	0.5	Orient 75 or more percent of homes and/or buildings to face either north or south (within 30 degrees of North or South). Building design includes roof overhangs that are sufficient to block the high summer sun, but not the lower winter sun, from penetrating south facing windows. Trees, other landscaping features and other buildings are sited in such a way as to maximize shade in the summer and maximize solar access to walls and windows in the winter.
29	Non-Roof Surfaces	C	M	R	1	Provide shade (within 5 years) and/or use light-colored/high-albedo materials (reflectance of at least 0.3) and/or open grid pavement for at least 30% of the site's non-roof impervious surfaces, including parking lots, walkways, plazas, etc.; OR place a minimum of 50% of parking spaces underground or covered by structured parking; OR use an open-grid pavement system (less than 50% impervious) for a minimum of 50% of the parking lot area. Unshaded parking lot areas, driveways, fire lanes, and other paved areas have a minimum albedo of .3 or greater
30	Green Roof	C	M	R	0.5	Install a vegetated roof that covers at least 50% of roof area. Project should demonstrate detailed graphics depicting the planned roof, detailed information on maintenance requirements for the roof, and the facilities plan for maintaining the roof post construction.
<u>TDM and Misc. Measures</u>						
31	Electric lawnmower	?	?	R	1	Provide a complimentary electric lawnmower to each residential buyer

Additional GHG Emission Reduction Measures Requiring Additional Investigation		
1	Bike Lane Street Design	Incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.
2	Bike & pedestrian design	Include pedestrian and bicycle-only streets and plazas within developments. Create travel routes that ensure that destinations may be reached conveniently by public transportation, bicycling or walking.
3	School siting	Site schools to increase the potential for students to walk and bike to school.
4	Transit street design	The project will provide for on-site road and off-site bus turnouts, passenger benches, and shelters as demand and service routes warrant subject to review and approval by local transportation planning agencies.
5	Site design measures	Site design to minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.
6	Other mixed-use	All residential units are within 1/4 mile of parks, schools or other civic uses.
7	Mixed-Use	Include mixed-use, infill, and higher density in development projects to support the reduction of vehicle trips, promote alternatives to individual vehicle travel, and promote efficient delivery of services and goods.
8	Open Space	Preserve and create open space and parks. Preserve existing trees, and plant replacement trees at a set ratio.
9	Natural Gas Stove	Project features only natural gas or electric stoves in residences.
10	Solar Design	Incorporate appropriate passive solar design and solar heaters.
11	Vehicle Idling	Limit idling time for commercial vehicles, including delivery and construction vehicles.
12	Ride Sharing Programs	Create car sharing programs. Accommodations for such programs include providing parking spaces for the car share vehicles at convenient locations accessible by public transportation.
13	Shuttle Service	Provide shuttle service to public transit.

14	School Bus Services		Work with the school district to restore or expand school bus services.
15	Shuttle Bus Services		Operation of a shuttle bus to shopping, health care, public services sites and other nearby trip attractors to reduce automobile use.
16	Energy efficient appliances		Install energy efficient heating and cooling systems, appliances and equipment, and control systems.
17	Renewable Energy Use		Install solar, wind, and geothermal power systems and solar hot water heaters. Educate consumers about existing incentives.
18	Solar Panels in Parking areas		Install solar panels on carports and over parking areas.
19	Photovoltaic Roofing Tiles		Install Photovoltaic roofing tiles for solar power.
20	Tree Planting		Protect existing trees and encourage the planting of new trees. Adopt a tree protection and replacement ordinance, e.g., requiring that trees larger than a specified diameter that are removed to accommodate development must be replaced at a set ratio.
21	Local Farmer's Market		Project shall dedicate space in a centralized, accessible location for a weekly farmers' market.
22	Community Gardens		Project shall dedicate space for community gardens.
23	Best management practices		Require best management practices in agriculture and animal operations to reduce emissions, conserve energy and water, and utilize alternative energy sources, including biogas, wind and solar.
24	Land Use Density		The project should provide densities of nine units per acre or greater, where allowed by the General Plan and/or Zone Plan, along bus routes and at bus stops to encourage transit use, where feasible.
25	Zero Emission Infrastructure		Provide the necessary facilities and infrastructure to encourage the use of low or zero-emission vehicles (e.g., electric vehicle charging facilities and conveniently located alternative fueling stations).
26	Low carbon fuel incentive program		Institute a low-carbon fuel vehicle incentive program.

Final Draft Staff Report

Appendix K:
Comments to Responses
(June 30, 2009)

SUMMARY OF SIGNIFICANT COMMENTS RECEIVED FROM WORKSHOP HELD JUNE 30, 2009

Climate Change Action Plan: Addressing Greenhouse Gas Emissions Under the California Environmental Quality Act

Stakeholders providing comments:

- Arthur Unger (AU)
- California Cotton Ginners and Growers Association (CCGGA)
- Center for Biological Diversity (CBD)
- Center on Race, Poverty & the Environment (CRPE)
- City of Fresno (CF)
- Constellation Wines US (CWUS)
- Dairy CARES (DC)
- Dudek (D)
- EarthJustice (EJ)
- Fresno Public Health Department (FPHD)
- Kern County Planning Department (KCPD)
- Kern Oil & Refining Company (KORC)
- Sierra Club (SC)
- Silgan Containers MFG. Corp. (SCMC)
- Southern CA Gas Company (SCGC)
- Vector Environmental, Inc. (VEI)
- Western Agricultural Processors Association (WAPA)
- Western States Petroleum Association (WSPA)
- Western United Dairymen (WUD)

Best Performance Standards (BPS)

1. **Comment:** Focusing on AB32, the proposed threshold ignores the long term emission reductions necessary to stabilize the climate and the relevant environmental objectives from which to derive a threshold of significance for the greenhouse gases. (CBD, EJ,CRPE)

Response: The GHG emission reduction targets established pursuant to AB32 are legislative mandates based on the state's understanding of climate change and its causes. Attempting to establish significance thresholds based on yet to be established GHG emission reduction targets, or on executive-directive reduction targets established without public process, is speculative and thus outside the technical consideration required by CEQA.

2. **Comment:** The Draft CCAP Report provides no analysis of the emissions BPS do not capture and whether these emissions constitute a cumulatively

significant impact. The Draft CCAP Report does not connect BPS with the attainment of a defined and scientifically based environmental objective. (CBD, EJ, CRPE)

Response: This comment is not correct. The proposed GHG significance determination, and the reductions expected, directly link BPS with the attainment of GHG emission reduction targets legislatively mandated by the State of California.

3. **Comment:** The proposed BPS capture only a portion of the carbon footprint of a particular source. For example, the BPS for livestock rearing focuses only on methane and ignores emissions from vehicle trips, energy use, and water consumption that are also a direct or indirect effect of livestock rearing operations. To properly address a project's emissions it is important for a project that is significant to analyze all of its impacts on the environment, including indirect or lifecycle impacts, to the extent possible. Because the BPS focuses on a subset of a project's emissions, it improperly short circuits the full consideration and mitigation of project impacts. (CBD, EJ, CRPE)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes. The District agrees that both direct and indirect source of GHG emissions should be considered when evaluating project specific impacts and when establishing BPS. The staff report has been revised to more clearly reflect consideration of both direct and indirect sources of GHG emissions. However, consistent with OPR's proposed revisions to the CEQA Guidelines lifecycle impacts are not required to be considered when evaluating impacts from project specific GHG emissions.

4. **Comment:** The Staff Report needs to clarify that the BPS are examples only. (KORC, DC, VEI)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance.

5. **Comment:** The proposed guidance doesn't consider the use of renewable fuels as an approved BPS. It is important to recognize that the EPA's Renewable Fuel Standards (RFS) Program and CARB's Low Carbon Fuel Standard (LCFS) require refiners to invest millions of dollars in capital to begin manufacturing renewable and low carbon fuels predicated by Climate Change Program mandates, such as AB32. Kern recommends the BPS for internal combustion engines (gasoline or diesel) should satisfy CEQA project mitigation by fueling the engine on renewable or bio-fuels that meet the specification of either the Federal RFS or the State LCFS programs. (KORC)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During

the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

6. **Comment:** In the development of BPS, there should be an option to install an engine that uses a fuel versus electrification and the District should remain fuel neutral. The engine should be the best performing engine for the corresponding fuel type. The requirement of electric as the standard goes beyond the guidance for achieving AB32 greenhouse gas emission reduction goals. (CCGGA)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

7. **Comment:** The District guidance does not include enough flexible alternatives or pathways for determining that a project is less than significant without application of BPS or a 29% reduction from BAU; the District should include additional alternatives in its guidance. (DC)

Response: This guidance is an evolving document which will be revised in the future as additional approaches become available. Lead agencies maintain the flexibility in providing alternative pathways in demonstrating a less than significant impact.

8. **Comment:** There is a concern that feed cost measures restrict economic feasibility. (WUD)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

9. **Comment:** None of the BPS options identified in the draft guidance (for dairies) are workable and are likely to cause severe and unintended consequences if included in CEQA guidance documents in their present form. Urge the “illustrative examples” be removed pending discussion with stakeholders on whether the BPS policy should even apply to agriculture sources. Thorough stakeholder input is strongly urged prior to the publication of any additional draft guidance in this area. (DC)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During

the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

- 10. Comment:** If an agricultural source does not take the BPS or 29% reduction pathway, it is not clear how or whether it could establish that its GHG emissions are less than significant, or if there is any such nonzero level of emissions, no matter how small, that could be determined as “less than significant” for CEQA reasons. (DC)

Response: As presented in the Draft Staff Report, the District has considered the various options for determining significance of project specific GHG emissions and concludes that use of performance based standards is the best approach. However, the methodology may evolve as the science progresses.

- 11. Comment:** It is suggested that the definition for BPS be rewritten to eliminate any confusion with the established definition for BACT (under the Clean Air Act) and industry-based, operationally based BPS. The definition should be amended to ensure proper interpretation of the term “Best Performance Standards.” (WSPA)

Response: The Draft Staff Report has been revised to include key definitions, including a definition of BPS.

- 12. Comment:** In Section 5.1.2 of the Draft Staff Report, it is suggested that the wording of the second sentence in the paragraph be replaced with this statement: “the District is presenting BPS that are illustrative in nature and for demonstration purposes only. Specific BPS will be developed subsequent to the Board approval of the BPS development process and in cooperation with interested parties“. This statement is reflective of the discussion at the workshop (Slide 17) of presentation. (WSPA)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

- 13. Comment:** It is requested that the District reassess how the introduction to Section 5.3.3 is written to avoid future misuse of the Draft CCAP Staff Report.

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

- 14. Comment:** It is suggested that the section on fossil fuel-fired, steam generators and process heaters needs to be completely rewritten to be more

consistent with subsequent sections (in terms of general guidance) and responsive to technological and operational practicalities. (WSPA)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

- 15. Comment:** Concerned that the BPS process seems to establish outdated technologies or processes as the “baseline” for determining GHG reductions. How much of those 2002-2004 “baseline” technologies/practices would be allowed to be installed/used now? It seems untenable to allow new projects to calculate reductions from a standard that would not be allowed today. (EJ)

Response: ARB’s Scoping Plan projects the 2002-2004 baseline emissions inventory to establish the 2020 Business-As-Usual (BAU) emissions inventory. The Plan estimates that a 29% reduction in GHG emissions from BAU is required to achieve the targeted 1990 emissions level. GHG Emission reductions achieved since the baseline period contribute to achieving the required 29% reduction target and should be considered when evaluating project related GHG emissions as compared to BAU.

- 16. Comment:** In section 5.1.4 Process of Establishing Best Performance Standards: the section is seriously flawed and needs to include consideration of “cost effectiveness.” A BPS selection process that is based on a listing of all technologically feasible and achieved in practice control technologies without due consideration of cost effectiveness is unacceptable. It is recommended the District conduct a cost-effectiveness and socio-economic impact analysis for this proposed plan. (KORC, SCGC)

Response: The District acknowledges the recommendation to consider cost effectiveness when establishing BPS. When determining that a particular GHG reduction measure has been achieved-in-practice, the District will consider the extent to which grants or other financial subsidies influence economic feasibility of a specific technology or GHG reduction measure. The Draft Staff Report discussion on establishing BPS has been amended consistent with this position.

- 17. Comment:** CWUS is generally supportive of the use of BPS as a CEQA mitigation measure. However, the proposed process for establishing a BPS should include a step for assessing economic feasibility. (CWUS)

Response: The District acknowledges the recommendation to consider cost effectiveness when establishing BPS. When determining that a particular GHG reduction measure has been achieved-in-practice, the District will consider the extent to which grants or other financial subsidies influence economic feasibility of a specific technology or GHG reduction measure. The

Draft Staff Report discussion on establishing BPS has been amended consistent with this position.

Business as Usual (BAU)

- 18. Comment:** Neither SJVAPCD nor any other entity has established meaningful assumptions for measuring BAU for areas like transportation emissions. Does BAU vary from project to project or is it a static concept? Could a project close to a transit claim it is below BAU in comparison to a hypothetical project away from transit? Could a project simply do nothing but take credit for mandated increases in fuel economy as a means to assert it is below BAU? (CBD, EJ, CRPE)

Response: ARB's Scoping Plan projects the 2002-2004 baseline emissions inventory to establish the 2020 Business-As-Usual (BAU) emissions inventory. BAU, as established by CARB, is a projected emissions inventory for 2020 and does not represent actual business or operational practices generating GHG emissions. Consequently, BAU is a static value that does not vary from project to project within the same GHG emissions category. To translate BAU into an emissions generating activity, the District proposes to establish emission factors per unit of activity, for each class and category, using the 2002-2004 baseline period. During this process, the District will seek stakeholder input.

Project specific GHG emission reductions would be determined by establishing a GHG emissions factor for the proposed project and comparing it to the emissions factor established for the 2002-2004 baseline period. Projects implementing BPS, or otherwise demonstrating that GHG emissions have been reduced by 29% will be determined to have a less than significant individual and cumulative impact on global climate change.

- 19. Comment:** Examining reductions from BAU involves a series of assumptions that can be difficult for the public to scrutinize and evaluate. The purpose of CEQA is to provide information on environmental impacts to decision makers and the public 'in a manner that will be meaningful and useful.' Use of a BAU, rather than a simple numerical metric thwarts this fundamental purpose. (CBD, EJ, CRPE)

Response: As discussed in Response to Comment 18, project specific GHG emissions would be compared to emission factors per unit of activity established per class and category for the baseline period. Additionally, as the Draft Staff Report indicates, development of BPS will include ample opportunity for public involvement. The process of establishing BPS includes advanced quantification of GHG emission reduction effectiveness, which will facilitate, not hinder, the ability of the public to scrutinize and evaluate project related impacts and mitigation measures.

- 20. Comment:** There are concerns on accomplishing an 80% GHG emission reduction below 1990 levels by 2050 when only 29% below business as usual levels are recommended and by suggesting that projects built today are already below BAU due to additional regulation passed since the baseline period. (CBD, EJ, CRPE, AU)

Response: The scope of the guidance is based on AB32's goal of meeting the 1990 GHG emissions level by year 2020. The guidance being proposed establishes a process for determining significance of project specific GHG emissions, consistent with the legislatively mandated GHG emission reduction targets.

As presented in the Draft Staff Report, the District has considered the various options for determining significance of project specific GHG emissions and concludes that use of performance based standards is the best approach. However, the methodology may evolve as the science and/or legislation progresses.

- 21. Comment:** When does mitigation start for a project? How does a new boiler achieve 29% in relation to "business as usual" (boiler in 2002-2004)? (CF)

Response: As presented in the Draft Staff Report, BAU is a projected emissions inventory, based on the 2002 through 2004 baseline period and is not based on specific operational parameters. The District is proposing that emission reductions achieved since the 2002-2004 be credited towards achieving the targeted 29% reduction in GHG emissions. For the specific example of a new boiler, the actual percent reduction in GHG emissions to be achieved by BPS will be established by the process presented in the Draft Staff Report.

- 22. Comment:** In the Rio Bravo Ranch EIR, BAU means building with no mitigation measures whatsoever (pages 5.7-54 through 5.7-56). In order to prevent abuse, BAU should be clearly defined. For example, what mitigation measures should be included in BAU? Is it permissible to include no mitigation measures at all? Should measures that are required under some adopted program be considered mitigation measures or as a part of BAU? (SC)

Response: The Draft Staff Report has been amended to include a definition of BAU to be used in the context of establishing BPS and assessing GHG emission reduction measures. As presented in the Draft Staff Report, BAU is a projected emissions inventory, based on the 2002 through 2004 baseline period and is not based on specific operational parameters. The use of BAU by ARB for establishing GHG emission reduction targets has a different meaning than expressed in the EIR.

As presented in the Draft Staff Report, the District is proposing that all emission reductions achieved since the 2002-2004, including compliance with

an adopted program, be credited towards achieving the targeted 29% reduction in GHG emissions.

As presented in the Draft Staff Report, the District has considered the various options for determining significance of project specific GHG emissions and concludes that use of performance based standards is the best approach. However, the methodology may evolve as the science progresses.

Greenhouse Gas Reductions

23. Comment: It is important that the District doesn't create GHG requirements which would discourage the voluntary replacement of old equipment with newer technology, just because the reduction is less than the 29% goal identified in the Staff Report. A net reduction should be a net reduction. If a replacement/reconstruction project can satisfy the basic permitting and prohibitory rule requirements for the source category, we want people to continue to propose these projects. (SCMC)

Response: Implementation of BPS is not expected to discourage voluntary equipment replacement projects. The requirement to meet BPS would only apply to projects resulting in increases in GHG emissions. Therefore, voluntary replacement of older equipment would not require implementation of BPS, unless the project would result in an increase in GHG emissions, as compared to pre-project GHG emission levels.

24. Comment: The proposed 29% below BAU ignores the longer term GHG emission reduction targets necessary to reduce the risk of dangerous climate change. The proposed thresholds should be revised to account for scientific data on emission reductions necessary to minimize the risk of dangerous climate change. (CBD, EJ, CRPE)

Response: The scope of the guidance is based on AB32's goal of meeting the 1990 GHG emissions level by year 2020. The guidance being proposed establishes a process for determining significance of project specific GHG emissions, consistent with the legislatively mandated GHG emission reduction targets.

As presented in the Draft Staff Report, the District has considered the various options for determining significance of project specific GHG emissions and concludes that use of performance based standards is the best approach. However, the methodology may evolve as the science progresses.

25. Comment: The 29% reduction target in the draft CCAP is excessive and economically unachievable considering the only viable control that reduces combustion GHG emissions is to limit fuel usage (e.g., shut down combustion

sources, manufacture less, purchase costly credits, and/or go out of business. (KORC)

Response: The scope of the guidance is based on AB32's goal of meeting the 1990 GHG emissions level by year 2020, but it's important to recognize that for CEQA purposes, its application is limited to projects with GHG emissions increases. The guidance being proposed establishes a process for determining significance of project specific GHG emissions increases, consistent with the legislatively mandated GHG emission reduction targets.

As presented in the Draft Staff Report, the District has considered the various options for determining significance of project specific GHG emissions increases and concludes that use of performance based standards is the best approach. However, the methodology may evolve as the science progresses.

26. Comment: If small projects are allowed to be considered insignificant, how do we know the sum of these small projects will not be cumulatively significant? Could some of these small projects have GHG sources that are exceptionally easy to mitigate? (AU)

Response: Our proposed BPS approach applies to all projects with increases in GHG emissions, so it does not consider small projects to be insignificant.

27. Comment: Based on lead agency experience with the recent Big West Flying J Refinery Expansion, we would recommend that this policy not apply to larger industrial projects as the technology is specific to the industry. GHG emissions reductions can be achieved through changes in operations that cannot always be established ahead of time as best performance standards. (KCPD)

Response: The principal of the proposed approach of determining significance of project specific GHG emissions would apply to all projects subject to CEQA. As presented in the Draft Staff Report, GHG emissions would be quantified for projects requiring preparation of an EIR. For such projects, the significance determination would be based on whether or not it incorporates BPS, or if project specific GHG emissions have been reduced by 29%. However, lead agencies will continue to have the flexibility currently provided under CEQA to exercise discretionary judgment related to imposing feasible mitigation and determining significance.

28. Comment: District stated that projects that do not result in an increase in greenhouse emissions will not be subject to the Climate Change Action Plan (CCAP). However, there is no such provision in the current draft of the CCAP. (VEI)

Response: While it is inherent in the basic concepts of CEQA, the Draft Staff Report has been amended to clarify that projects not resulting in an increase in GHG emissions will be considered to have a less than significant individual and cumulative impact on global climate change.

29. Comment: How will GHG reductions be calculated? (VEI)

Response: GHG emission reductions will be calculated according to methodologies approved by the District. The Draft Staff Report discusses the general concepts of calculating GHG emission reductions. These principals will be applied to establish specific methodologies for each identified class and category of GHG emission source. Additionally, the District will give consideration to methodologies developed by ARB and other agencies with expertise in evaluating GHG emissions.

30. Comment: How will the District account for an increase in the number of sources over time, as BPS is currently being achieved? Will reductions be valid or offset by increase in number of sources? (FPHD)

Response: As presented in the Draft Staff Report, BAU is a projected emissions inventory, based on the 2002 through 2004 baseline period and is not based on specific operational parameters. ARB established the projected emissions inventory with consideration of anticipated growth in the number of GHG emission sources. As illustrated in the Draft Staff Report, the AB 32 projected 29% reduction in GHG emissions, including growth, will meet the 1990 GHG emissions level target.

31. Comment: The staff report should include specific details about these existing emission reductions for which a project could be credited. For example, will a project automatically be given credit towards the 29% reduction for Title 24 upgrades since 2004? (SC)

Response: The Draft Staff Report has been amended to clarify that emission reductions achieved since the 2002 – 2004 baseline period will be credited towards achieving the required 29% reduction in GHG emissions to meet the 1990 emissions level target.

32. Comment: Will credit toward the 29% reduction be applied for statewide measures that CARB is responsible for? For example, a significant reduction in passenger and light truck emissions will be achieved with implementation of the Pavley vehicle standards upon EPA approval of the waiver. Similarly, emission reductions will be achieved through more stringent Renewable Portfolio Standards applicable to electric utilities. (D)

Response: Achieving the GHG emission reduction targets requires a multifaceted approach. Achieved reductions in GHG emissions, regardless of the mechanism, will be credited towards achieving the required 29% reduction in GHG emissions to meet the 1990 emissions level target.

Miscellaneous

33. Comment: If a project would not normally be considered subject to CEQA, requirements should not be created which will add CEQA burdens. (SCMC)

Response: As stated in the Draft Staff Report, projects determined to be exempt from CEQA would not require analysis of project specific GHG emissions and would not require implementation of BPS.

34. Comment: The SJVAPCD needs to explain how the cumulative total of the emissions it's not capturing will not have a significant environmental effect. For example, by using a 29% BAU threshold, SJVAPCD is saying that allowing 71% of emissions from all new development to be released into the atmosphere would not have a significant environmental effect. The conclusion is unsupportable given that emissions must be reduced by more than 80% below 1990 levels to avoid dangerous climate change. (CBD, EJ, CRPE)

Response: The GHG emission reduction targets established pursuant to AB32 are legislative mandates based on the state's understanding of climate change and its causes. Attempting to establish significance thresholds based on yet to be established GHG emission reduction targets, or on executive-directive reduction targets established without public process, is speculative and thus outside the technical consideration required by CEQA.

35. Comment: The Draft CCAP Report misleadingly states that "execution of a zero threshold would be difficult or impossible." The best available science most strongly supports a zero threshold. The further a threshold is from zero, the more tenuous the evidence to support a determination that the threshold is effective at meeting the environmental objective of avoiding dangerous climate change. (CBD, EJ, CRPE)

Response: The District agrees neither with the assertion that the "Draft Staff Report is misleading", nor with the statement that "the best available science most strongly supports a zero threshold". On the contrary, District staff thinks it is impossible, using today's science, to say that any single project has a significant impact on global climate change. The District's rationale for supporting a BPS approach for determining cumulative significance of project specific GHG emissions is clearly presented in the Draft Staff Report: the District has considered the various options for determining significance of project specific GHG emissions and concludes that use of performance based standards is the best approach. However, the methodology may evolve as the science progresses.

36. Comment: The commenter believes the District could justify the further use of the Scoping Plan to establish a level of insignificance. For instance, agricultural pumps are not subject to regulation according to the Scoping Plan and therefore that emissions category should be considered insignificant for

GHG CEQA purposes. BPS may work for streamlining permits for larger sources. The standards currently written place a heavy burden on small sources. (CCGGA, WAPA)

Response: The Scoping Plan itself cannot be used as a threshold. During the process of developing BPS, the District will consider the extent to which CARB has developed guidance specific to a given GHG emissions source category.

- 37. Comment:** Since tier two projects would not have to mitigate the GHG they generate, it is critical to limit the number and GHG generation of tier two projects. (AU)

Response: The tier approach presented in the Draft Staff Report was part of a discussion of the various options for establishing a process of assessing significance of project specific GHG emissions. As presented Chapter Four, the District is proposing a performance based approach for all projects with increases in greenhouse gases emissions.

- 38. Comment:** Why should the bottom of page 70 (in Staff Report) assume that equipment operated during the 2002-2004 baseline emission inventory is assumed to be natural gas-fired IC engine, rather than utility supplied electric power? Without this assumption the 42% net emission reduction can not be achieved. (AU)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

- 39. Comment:** Incorporating GHG into soil (Staff Report: Page 93) might improve with consultation with soil scientists. Would no till farming or organic farming, sequester more carbon than methods now used in the Valley? (AU)

Response: The Draft Staff Report has been revised to clarify that BPS are presented for illustrative purposes, and should not be used by a lead agency to determine best performance standards for use with our guidance. During the development process of BPS, District plans to involve stakeholders in identifying BPS for each industry sector.

- 40. Comment:** It is not appropriate to equate agricultural sources/sinks for GHG emissions with large fossil-fuel combustion sources. A “one-size-fits-all” policy not only is inappropriate but inconsistent with state and federal policies. (DC)

Response: As presented in the Draft Staff Report, the District has considered the various options for determining significance of project specific GHG emissions and concludes that use of performance based standards is the best approach. As proposed, all projects which would result in increased GHG

emissions are required to reduce and or mitigate project specific GHG emissions. Although all projects would be required to reduce GHG emissions, BPS is specific to each Category and Class.

- 41. Comment:** The guidance and policy should clearly and explicitly state that a project in conformance with an adopted Climate Change Action Plan is considered less than significant and does not contribute to cumulative impacts. (KCPD)

Response: As presented in the Draft Staff Report projects complying with an approved GHG emission reduction plan or GHG mitigation program, which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency.

- 42. Comment:** Recommend considerations be given to projects that have undergone environmental review where such review included consideration of GHG emissions and the projects were subsequently issued negative declarations or mitigated negative declarations. (VEI)

Response: Nothing being proposed by the District would change the principals of CEQA. Projects approved by a lead agency and supported by a CEQA compliant environmental assessment would be reviewed consistent with existing CEQA Guidelines and would not be required to implement GHG reduction measures beyond those imposed by the lead agency.

- 43. Comment:** With respect to determinations made for projects that have undergone environmental review without consideration of GHG emissions, we recommend that additional review be conducted pursuant to State CEQA Guidelines Section 15164 (Addendums to EIR or Negative Declarations). (VEI)

Response: Nothing being proposed by the District would change the principals of CEQA. Projects approved by a lead agency and supported by a CEQA compliant environmental assessment would be reviewed consistent with existing CEQA Guidelines, including CEQA Guidelines Section 15164.

- 44. Comment:** What are the pros & cons of how SB375 and ARB's efforts to draft geographic targets relate to the District's Guidance? (CF)

Response: In general, geographic targets have the potential benefit of implementing program level VMT reduction measures that relate to transportation and land use planning. The success of these efforts however depends greatly on collaboration among multiple land use and state agencies. However, it is important to note that the light-duty vehicle emissions resulting from development projects complying with plans resulting from SB 375

implementation will be exempt from further CEQA review, and therefore will not be subject to this District proposed guidance.

- 45. Comment:** “Achieved in Practice” needs to be addressed, and further discussed in the Staff Report. (CCGGA)

Response: The Draft Staff Report has been revised to include key definitions, including a definition of “Achieved in Practice”.

- 46. Comment:** In GHG Banking Staff Report, the District says it will be revising its CEQA policy to address GHG emissions. Is this the policy the District is referring to? If so, when will this revision be subject to CEQA, as mentioned in the response to comments? (EJ)

Response: The District staff was not able to find the reference to the District CEQA Implementation Policy in GHG Banking Staff Report. However, the “policy” referenced in the District CEQA GHG Guidance Draft Staff Report is actually an internal District procedure for implementing CEQA during the permitting process. If the District’s governing Board adopts the proposed GHG significance determination guidance, the internal procedure will be revised to include consideration of GHG emissions. Revision of internal guidance is not subject to CEQA.

- 47. Comment:** Biogenic carbon dioxide emitted from combustion or fermentation of biomass should be considered to have net-zero GHG emissions. This clarification could be added to the Section 1.1, *description of carbon dioxide*, and Section 4.3.2, *Process*. Clarifying that biogenic CO₂ is a recycling of carbon, not added CO₂ to the ecosystem, will streamline evaluation of such projects. (CWUS)

Response: The District recognizes that certain sources of biogenic carbon can be considered to have net-zero GHG emissions. However, the determination that a specific source of biogenic carbon would have net-zero GHG emissions is a complex analysis, which should take into consideration the entire process, including activities which directly or indirectly contribute to total GHG emissions. The determination of whether a specific activity or source of biogenic carbon would be considered carbon neutral will be considered when developing BPS for a specific Class and Category.

Final Draft Staff Report

Appendix L: Evaluation of BPS Performance for Stationary Source Permitting Projects

Evaluation of BPS Performance for Stationary Source Permitting Projects

ARB in their AB32 Scoping Plan⁷⁵ concluded that an overall 29% reduction from BAU 2020 emissions levels was necessary to achieve the targeted 1990 emissions rate, and the District's BPS-based approach to addressing CEQA significance is designed to achieve that level of reductions from new growth in GHG emissions. This appendix is a demonstration that such reductions are achievable through implementation of BPS. The attached table summarizes the theoretical affect of implementing our illustrative example BPS, using a two-year history of permitting actions in the San Joaquin Valley. We have categorized the expected reductions as follows:

Facilities NOT subject to ARB's cap-and-trade program

For facilities not subject to cap-and-trade, calculations of GHG emission reductions are directly based on implementing the District's illustrative example BPS. We examined each permitting project that took place in the past two years in the San Joaquin Valley Air District. For those projects for which we proposed an illustrative example BPS, we theoretically applied the BPS to the project, and analyzed the resulting GHG emissions reduction. The percent reduction for each type of projects is shown, as is the total emissions and total emissions reduction for the type of source.

Facilities subject to ARB's cap-and-trade program

The AB 32 Scoping Plan evaluated a comprehensive array of approaches and tools to achieve the required GHG emission reductions to achieve the 1990 GHG emission levels. ARB concluded that reducing GHG emissions from a wide variety of the largest sources can best be achieved through establishment of a cap-and-trade program. The program would establish a limit or "cap" on total GHG emissions generated by sectors covered by the system. The AB32 Scoping Plan identifies the following four sectors that would be subject to a cap-and-trade program: transportation, electricity, commercial and residential, and industry. ARB has determined that for the four sectors included within the cap-and-trade program overall, annual GHG emissions would be reduced from 512 MMTCO₂E (projected 2020 BAU) to 365 MMTCO₂E⁷⁶. This represents a 28.7% reduction in GHG emissions compared to BAU.

$$28.7\% \text{ Total Reduction} = \frac{512 \text{ MMTCO}_2\text{E}(2020 \text{ BAU Capped Emissions}) - 365 \text{ MMTCO}_2\text{E}(2020 \text{ Target Capped Emissions})}{512 \text{ MMTCO}_2\text{E}(2020 \text{ BAU Capped Emissions})}$$

⁷⁵ *Climate Change Proposed Scoping Plan*; P. 21. California Air Resources Board, October 2008

⁷⁶ *Climate Change Proposed Scoping Plan*; P. 21. California Air Resources Board, October 2008

Facilities subject to ARB's cap-and-trade program are expected to contribute to the overall 29% GHG emissions cap-and-trade reduction target. For these facilities, since implementation of BPS is required for all emission sources with increased GHG emissions, reductions achieved by implementing BPS will be additive to GHG emission reductions achieved at the facility level under the cap-and-trade program. However, per the District's proposed guidance, projects complying with a GHG emissions reduction program approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document would be considered to have a less than significant individual and cumulative impact on global climate change. Such projects would not be required to implement BPS. To ensure that the District's estimates of total GHG emission reductions that would be achieved through implementation of BPS are conservative, District staff has assumed for the purposes of this analysis only that the approved cap-and-trade program will have been specified in law or otherwise supported by a CEQA compliant environmental review document such that GHG impacts from projects in these cap-and-trade categories will be considered to have a less than significant individual and cumulative impact on global climate change. Therefore, for projects occurring at facilities belonging to sectors subject to the cap-and-trade program, emission reductions achieved through implementing BPS have been calculated as above, but are not added to the overall 28.7% reduction achieved through compliance with cap-and-trade. For these facilities, the District conservatively limits GHG emission reduction estimates to the 28.7% cumulative reduction that will be achieved through compliance with cap-and-trade provisions.

Overall GHG Emission Reductions

As presented in Table 1, implementing BPS will achieve an overall 34.0% reduction in GHG emissions, thus demonstrating that implementing BPS, even excluding the affects of BPS on Cap-and-Trade sources, exceeds the overall 29% GHG emission reduction targeted by ARB in the scoping plan.

Table 1: GHG Emission Reductions

GHG Emission Reductions Due to Combined Implementation of Illustrative Examples of Best Performance Standards (BPS) and Cap-and-Trade Program for District Projects During 2007 and 2008								
BPS Category	GHG Emissions Increases Due to New Units (tons-CO2/yr)	GHG Emission Increases Due to Modifications (tons-CO2/yr)	Total GHG Emissions Increase (tons-CO2/yr)	Evaluated Total GHG Reductions Due to BPS (tons-CO2/yr)	Cap & Trade Emission Reduction (tons-CO2/yr)	Percent GHG Emissions Reductions Due to BPS Only	Percentage Emission Reduction Due to Combined Cap & Trade Plus BPS	
Facilities Not Subject to Cap & Trade								
Boilers, Process Heater and Steam Generators > 5MMBtu/hour	244,111	43,836	287,947	19,590	0.0%	6.8%	6.8%	
Non-Emergency Flares > 5 MMBtu/hr	15,548	97,487	113,035	50,325	0.0%	44.5%	44.5%	
Non-Emergency Onsite Electric Power Generation with Fossil Fuel Combustion > 5 MMBtu/hr of with Fossil Fuel Fired Mechanical Driver > 50 hp	13,472	0	13,472	8,892	0.0%	66.0%	66.0%	
Non-Emergency Mechanical Equipment Driver	94,045	2,269	96,314	65,289	0.0%	67.8%	67.8%	
Fossil Fuel-Fired Cogeneration (combustion turbines > 3 MMBtu/hr or other combustion devices > 5 MMBtu/hr)	27,606	0	27,606	6,625	0.0%	24.0%	24.0%	
Landfill Operations	0	183	183	7,508	0.0%	4102.7%	4102.7%	
Wastewater Treatment Operations	0	0	0	0	0.0%	0.0%	0.0%	
Oil and Gas Extraction, Storage, Transportation and Refining Operations (fugitive emissions)	9	46,901	46,910	69,359	0.0%	147.9%	147.9%	
Farming Operations - Livestock Rearing	654,382	87,820	742,202	336,557	0.0%	45.3%	45.3%	
Farming Operations - Application of Manure to Cropland	0	0	0	0	0.0%	0.0%	0.0%	
Facilities Subject to Cap & Trade								
Boilers, Process Heater and Steam Generators > 5MMBtu/hour	1,527,074	300,791	1,827,865	117,593		6.4%		
Flares	24,387	224,095	248,482	94,240		37.9%		
Non-Emergency Onsite Electric Power Generation with Fossil Fuel Combustion > 5 MMBtu/hr of with Fossil Fuel Fired Mechanical Driver > 50 hp	0	0	0	0	612,149	0.0%	28.7%	
Non-Emergency Mechanical Equipment Driver	1,135	0	1,135	749		66.0%		
Fossil Fuel-Fired Cogeneration (combustion turbines > 3 MMBtu/hr or other combustion devices > 5 MMBtu/hr)	55,440	0	55,440	13,306		24.0%		
Total Impact of BPS and Cap-and-Trade	2,657,209	803,382	3,460,591	790,033	612,149		34.0%	